

Descriptions and Preliminary Evaluations of Existing California Marine Protected Areas December 2004

What is an MPA?

State law defines an MPA as a named discrete geographic area that has been designated by law, administrative action, or voter initiative to protect or conserve marine life and habitat. MPAs are primarily intended to protect or conserve marine life and habitat, and are considered to be a subset of marine managed areas (MMAs). The primary distinction between the two groups is that all MPAs have specific regulations designed to limit the take of living resources.

Estuarine protected areas are, by definition, considered to be marine protected areas. Estuarine waters include bays, lagoons, and the mouths of coastal rivers. In these descriptions and evaluations, an MPA is considered to be either “entirely marine” or “estuarine”. Entirely marine areas have the coastal shoreline as their terrestrial boundary or, in a few cases, have all boundaries in the ocean. Estuarine MPAs have one or more boundaries inland of the mouth of a bay or estuary. There are currently 61 California MPAs that are entirely marine and 19 that are estuarine. Some existing MPAs have overlapping boundaries with differing regulations, as indicated in the following evaluations. When MPAs overlap, the more restrictive regulations for any species apply.

How are MPAs evaluated?

The Marine Life Protection Act (MLPA) requires an analysis of the state’s current MPAs, based on the preferred siting alternative for a proposed statewide network of MPAs. The analysis shall include “recommendations as to whether any specific MPAs should be consolidated, expanded, abolished, reclassified, or managed differently so that, taken as a group, the MPAs best achieve the goals” of the MLPA and conform to MLPA guidelines.

Since a preferred siting alternative has not yet been developed, the analyses of existing MPAs offered here are preliminary and are intended as a starting point for the more detailed analyses called for in the MLPA. Each characterization contains a general description of the habitats and depth range, a summary of existing regulations, the primary objectives for establishing the MPA, a summary of relevant research and monitoring within the MPA, and relevant scientific literature citations.

Also included is a preliminary assessment of the overall effectiveness of each MPA. This preliminary assessment is based on a variety of criteria, including baseline monitoring studies, comparisons of factors such as species diversity and density, individual animal sizes, the ability to provide research, educational, and non-extractive recreational opportunities, and the ability of the regulations to be enforced. One problem in evaluating MPA effectiveness for many existing MPAs is the lack of clearly defined goals when they were established. Many of

the estuarine MPAs do not have a preliminary assessment of overall effectiveness due to a current lack of available information.

A subsequent, more detailed, evaluation of each MPA will take place as the MLPA Initiative process focuses on individual regions and begins to develop and evaluate options for networks of MPAs for each region. Because one of the requirements of the MLPA is to “encompass a representative variety of marine habitat types and communities, across a range of depths and environmental communities”, in the form of marine life refuges (defined as no-take areas in the act and now known as state marine reserves), the subsequent evaluations must consider the need for changing existing MPAs or adding new ones in order to meet this and other requirements of the MLPA.

The literature cited in these preliminary evaluations includes those studies found as of December 2004, and is intended to be an initial review. The literature citations are organized into four categories and listed by reference number from the literature cited section of this report:

- 1) Published references which relate to the effectiveness of the particular MPA
- 2) Published references which relate to the use of the particular MPA as a site for research
- 3) Unpublished references which relate to the effectiveness of the particular MPA: and
- 4) Unpublished references which relate to the use of the particular MPA as a site for research.

If no citations are listed in the description of an MPA, none could be found for that MPA. New references may be added to this report as they become available. At the end of this report is a general list of published and unpublished references that relate to MPAs, including theoretical studies of MPA design where the work was not specifically conducted within or adjacent to MPAs off California. More references are available on the Department’s web site at: <http://www.dfg.ca.gov/mrd/mlpa>

The MPAs evaluated here are organized geographically from north to south by county in Table 1, below.

Table 1. State of California MPAs.

Humboldt County

Punta Gorda State Marine Reserve

Mendocino County

MacKerricher State Marine Conservation Area

Point Cabrillo State Marine Conservation Area

Russian Gulch State Marine Conservation Area

Van Damme State Marine Conservation Area

Manchester and Arena Rock State Marine Conservation Area

Sonoma County

Del Mar Landing State Marine Park

Salt Point State Marine Conservation Area

Gerstle Cove State Marine Conservation Area

Fort Ross State Marine Conservation Area

Sonoma Coast State Marine Conservation Area

Bodega State Marine Reserve

Napa County

Fagan Marsh State Marine Park

Marin County

Tomales Bay State Marine Park

Point Reyes Headlands State Marine Conservation Area

Estero de Limantour State Marine Conservation Area

Duxbury Reef State Marine Conservation Area

Corte Madera Marsh State Marine Park

Marin Islands State Marine Park

San Francisco County

Farallon Islands State Marine Conservation Area

Solano County

Peytonia Slough State Marine Park

Alameda County

Albany Mudflats State Marine Park

Robert W. Crown State Marine Conservation Area

San Mateo County

Redwood Shores State Marine Park

Bair Island State Marine Park

James V. Fitzgerald State Marine Park

Monterey County

Elkhorn Slough State Marine Reserve

Hopkins State Marine Reserve

Pacific Grove State Marine Conservation Area

Carmel Bay State Marine Conservation Area

Point Lobos State Marine Reserve

Julia Pfeiffer Burns State Marine Conservation Area

Big Creek State Marine Reserve

San Luis Obispo County

Atascadero Beach State Marine Conservation Area

Morro Beach State Marine Conservation Area

Pismo State Marine Conservation Area

Pismo-Oceano Beach State Marine Conservation Area

Santa Barbara County

Vandenberg State Marine Reserve

Santa Barbara County (Cont.)

Richardson Rock State Marine Reserve (San Miguel Island)
Judith Rock State Marine Reserve (San Miguel Island)
Harris Point State Marine Reserve (San Miguel Island)
South Point State Marine Reserve (Santa Rosa Island)
Carrington Point State Marine Reserve (Santa Rosa Island)
Skunk Point State Marine Reserve (Santa Rosa Island)
Painted Cave State Marine Conservation Area (Santa Cruz Island)
Gull Island State Marine Reserve (Santa Cruz Island)
Scorpion State Marine Reserve (Santa Cruz Island)
Refugio State Marine Conservation Area
Goleta Slough State Marine Park
Santa Barbara Island State Marine Reserve

Ventura County

Anacapa State Marine Reserve
Anacapa State Marine Conservation Area
Big Sycamore Canyon State Marine Reserve

Los Angeles County

Abalone Cove State Marine Park
Point Fermin State Marine Park
Catalina Marine Science Center State Marine Reserve
Farnsworth Bank State Marine Conservation Area
Lover's Cove State Marine Conservation Area

Orange County

Bolsa Chica State Marine Park
Upper Newport Bay State Marine Park
Robert E. Badham State Marine Park
Crystal Cove State Marine Conservation Area
Irvine Coast State Marine Park
Laguna Beach State Marine Park
Heisler Park State Marine Reserve
South Laguna Beach State Marine Park
Niguel State Marine Park
Dana Point State Marine Park
Doheny State Marine Park
Doheny State Marine Conservation Area

San Diego County

Buena Vista Lagoon State Marine Park
Agua Hedionda Lagoon State Marine Reserve
Batiquitos Lagoon State Marine Park
Encinitas State Marine Conservation Area
Cardiff and San Elijo State Marine Conservation Area
San Elijo Lagoon State Marine Park
San Dieguito Lagoon State Marine Park
San Diego-Scripps State Marine Conservation Area
La Jolla State Marine Conservation Area
Mia J. Tegner State Marine Conservation Area

HUMBOLDT COUNTY

Site name: Punta Gorda State Marine Reserve

Year established: 1994

Approximate Area: 1.97 nm²

Approximate Shoreline length: 1.74 nm

Approximate Depth range (feet): 18 to 180

Habitat types: Dominated by sand with some hard bottom; in a vigorous upwelling zone. Large wash rock (Gorda Rock) and a few subtidal pinnacles offshore.

Surrounding habitat types: Larger rocky habitat areas to the north near Cape Mendocino. Mattole Submarine Canyon is 2 miles north of the boundary. Spanish and Delgada Submarine Canyons are to the south. Canyon habitats are rocky with soft substrate on their slopes.

Summary of existing regulations: No take; no disturbance of bottom; no boats (except in transit), diving or other use except approved scientific research; public entry restricted.

Primary objectives: To satisfy requirements of the Marine Resources Protection Act of 1990 the Fish and Game Commission was required to establish four ecological reserves along the mainland coast; the King Range State Marine Reserve was one of the reserves established pursuant to the Act. The Act specified that the specific purpose of these reserves was "to provide for scientific research related to the management and enhancement of marine resources".

Existing Enforcement: This area is too remote to monitor on a regular basis (20-30 mi. to nearest port). Access is very difficult and ocean conditions are unsuitable most of the time for at sea patrol. Patrol from shore is not possible due to lack of road access.

Baseline and ongoing monitoring and research studies: 9, 84

Basic Evaluation: This MPA currently protects a small amount of rocky habitat which is unique in its encrusting invertebrate assemblage. Suitable habitat for nearshore finfish species of management concern is sparse within the MPA. The MPA also has low algal abundance due to high turbidity and sand scour. Karpov et al. (2001a) observed no red abalone within the MPA and very few red sea urchins. This report also recommended relocation of the MPA to an area with habitats more suitable for species of management concern, and to allow better access to the MPA for research and enforcement.

Published references related to effectiveness of this MPA: 85

Published references related to use of this MPA as a research tool: 84

MENDOCINO COUNTY

Site name: MacKerricher State Marine Conservation Area

Year established: 1970

Approximate Area: 0.54 nm²

Approximate Shoreline length: 3.30 nm

Approximate Depth range (feet): 0 to 18.

Habitat types: Exposed sand and impacted hard bottom habitat. Significant reef structure throughout the MPA at Laguna Point. Offshore habitat includes sand and hard bottom substrate. Primary habitats are sand beach, rocky intertidal, headland, kelp bed.

Surrounding habitat types: Extensive sandy areas to the north; to the south there is extensive hard bottom rocky reef beyond one mile from shore. Directly offshore, the substrate is hard bottom with high vertical relief (> 10ft).

Summary of existing regulations: Only the following species may be taken recreationally: finfish, red abalone, chiones, clams, cockles, rock scallops, native oysters, crabs, lobsters, ghost shrimp, sea urchins, mussels and marine worms except that no worms may be taken in any mussel bed unless taken incidentally to the take of mussels.

Only the following species may be taken commercially: finfish, crabs, ghost shrimp, jackknife clams, sea urchins, squid, algae (except giant kelp and bull kelp) and worms except that no worms may be taken in any mussel bed, nor may any person pick up, remove, detach from the substrate any other organisms, or break up, move or destroy any rocks or other substrate or surfaces to which organisms are attached.

Primary objectives: This site met the criteria for State Park-Underwater Park established by the California State Parks and Recreation Commission in the Underwater Parks Master Plan. Underwater parks consist of relatively spacious areas of outstanding scenic or natural character, containing significant historical, archaeological, ecological, or other features. The purpose of an underwater park is to preserve these natural, scenic, and cultural values, and to perpetuate them as outstanding examples of California's underwater environment and history. These criteria also include an area's proximity to an established terrestrial park.

In the Department of Parks and Recreation's (State Park) general plan for MacKerricher, the stated purpose of this site is "to make available to the people for their inspiration, enlightenment, and enjoyment, in an essentially natural condition, the outstanding scenic features and natural values, including offshore marine environs and submerged lands..." A stated goal is "to identify, protect, and perpetuate the diversity of existing ecosystems which are found at Manchester State Park, and are representative of California's seacoast." A stated objective is "to identify and protect...sensitive natural resources found in the park."

Existing Enforcement: The area is currently patrolled by State Park rangers and Department wardens.

Baseline and ongoing monitoring and research studies: The State Department of Parks and Recreation Parks (State Park) periodically conducts underwater biotic inventories of its underwater park

units and accompanying species lists are available (DeMartini 1991). In response to the Marine Life Protection Act and the Marine Managed Areas Improvement Act State Park is currently reviewing and evaluating State Parks, Underwater Parks, and Reserves. High resolution digital elevation model (DEM) bathymetry mapping was completed in 2001 from Noyo Harbor to Laguna Point out to one mile by a CDF&G contract with California State University at Monterey Bay. Baseline fish and invertebrate surveys were started by CDF&G in 2001 using an ROV (20 B 50 m depth).

Basic Evaluation: The area presently offers little in the way of resource protection since only certain invertebrates are protected from harvest. However, the area does function well by providing opportunities for recreation and scientific research. MacKerricher State Marine Conservation Area is just to the north of the city of Fort Bragg and is a popular destination for recreational abalone “shore-pickers” and divers. The open-ocean exposure of the MPA is unsafe for launching watercraft, thus recreational fishing is restricted to the shoreline. The intertidal zone at Laguna Point on the north end of the MPA is commonly used for research and educational activities and is the site of a large haul out and pupping area for harbor seals. Red sea urchins and nearshore finfish are harvested commercially along the southern portion of the MPA. The area is small, has limited public access to the water, and has on-site enforcement personnel. There is also good historical baseline data on invertebrate populations.

Published references related to use of this MPA as a research tool: 42, 80, 82

Site name: Pt. Cabrillo State Marine Conservation Area

Year established: 1975

Approximate Area: 0.07 nm²

Approximate Shoreline length: 0.35 nm

Approximate Depth range (feet): 0 to 180

Habitat types: Headlands and protected coves with sand beaches. Habitats include rocky intertidal, sand beaches, kelp beds, and coastal tributaries. Offshore habitat consists of soft and hard bottom substrate.

Surrounding Habitat types: Adjacent nearshore habitat is similar to that within the MPA.

Summary of existing regulations:

Take of all living marine resources is prohibited except the commercial take of finfish and marine aquatic plants.

Primary objectives: Point Cabrillo was originally designated as a "Reserve", and no legally mandated mission accompanies the reserve classification. Each reserve was created on a case-by-case basis to meet general goals of resource protection. Since these areas were established by the Fish and Game Commission, the authority to restrict collection or harvest of finfish did not pertain to commercial fishing.

Existing Enforcement: The shoreline is monitored by State Park rangers and Department wardens.

Baseline and ongoing monitoring and research studies: State Parks baseline evaluations available. High resolution digital elevation model (DEM) bathymetry mapping was completed in 2001 from Russian Gulch to Jughandle Point out to one mile by a CDF&G contract with CSUMB. Baseline fish and invertebrate surveys were started by CDF&G in 2000 and 2001 using an ROV (20 B 80 m depth).

Basic Evaluation: Pt. Cabrillo State Marine Conservation Area is a key site for Department red sea urchin, *Strongylocentrotus franciscanus*, and red abalone, *Haliotis rufescens*, dive surveys. Data from dive surveys at the site have resulted in several publications which have contributed to the management of abalone and urchin. The hard bottom areas in this MPA have been extensively mapped, and contain complex, high relief habitat for nearshore fish and invertebrates representative of the surrounding areas. Surveys have indicated that red urchin abundance is greater within the MPA than in adjacent fished areas. This MPA is one of the unusual protected areas that are currently closed to recreational fishing but open to commercial fishing for finfish.

Published references related to effectiveness of this MPA: 85

Published references related to use of this MPA as a research tool: 10, 63, 79, 80, 82, 83, 84

Site name: Russian Gulch State Marine Conservation Area

Year established: 1970

Approximate Area: 0.06 nm²

Approximate Shoreline length: 1.82 nm

Approximate Depth range (feet): 0 to 18

Habitat types: Headlands and protected coves with sand beaches. Offshore substrate consists of a mix of soft and hard bottom. Habitat includes kelp beds, surf grass, sand beaches, and rocky intertidal.

Surrounding habitat types: Similar intertidal and subtidal habitats and small sand beaches are found to the north and south. To the south are the Mendocino Headlands and large rock islands. Pt. Cabrillo State Marine Conservation Area is located approximately four miles to the north.

Summary of existing regulations:

Only the following species may be taken recreationally: finfish, red abalone, chiones, clams, cockles, rock scallops, native oysters, crabs, lobsters, ghost shrimp, sea urchins, mussels and marine worms except that no worms may be taken in any mussel bed unless taken incidentally to the take of mussels.

Only the following species may be taken commercially: finfish, crabs, ghost shrimp, jackknife clams, sea urchins, algae (except giant kelp and bull kelp) and worms except that no worms may be taken in any mussel bed, nor may any person pick up, remove, detach from the substrate any other organisms, or break up, move or destroy any rocks or other substrate or surfaces to which organisms are attached.

Primary objectives: This site met the criteria for State Park-Underwater Park established by the California State Parks and Recreation Commission. These criteria include marine area natural, recreational, cultural, and scenic underwater resources, as well as its proximity to an established terrestrial park.

Existing enforcement: This area is regularly patrolled by State Park rangers and Department wardens.

Baseline and ongoing monitoring and research studies: The Department of Parks and Recreation (DPR) conducts underwater biotic inventories of its underwater park units and accompanying species lists are available (DeMartini, 1990). In response to the Marine Life Protection Act and the Marine Managed Areas Improvement Act, DPR is currently reviewing and evaluating State Park Underwater Parks and Reserves.

Basic Evaluation: The area presently offers little in the way of resource protection since only certain invertebrates are protected from harvest. However, the area does function well by providing recreational opportunities. Due to the close proximity of this MPA to the towns of Fort Bragg and Mendocino and its high scenic value, Russian Gulch is a highly used state marine conservation area. This area offers shoreline entry for beginning to advanced divers, and small skiffs can be launched from the MPA's sheltered cove for access to nearby reefs for recreational abalone diving and fishing. This area is also easily accessed by commercial fishermen and sea urchin divers from the nearby fishing ports of Albion and Fort Bragg.

Published references related to use of this MPA as a research tool: 41

Site name: Van Damme State Marine Conservation Area

Year established: 1970

Approximate Area: 0.02 nm²

Approximate Shoreline length: 0.26 nm

Approximate Depth range (feet): 0 to 18

Habitat types: Headlands and protected coves with sand and cobble beaches. Offshore substrate consists of rock reefs and sand bottom. Habitats include kelp beds, sand beaches, cobble beaches, rocky intertidal, and a coastal tributary.

Surrounding habitat types: Headlands with small pockets of sand beaches to the north and south of this area with intertidal and subtidal substrate composed of mixed hard and soft bottom.

Summary of existing regulations:

Only the following species may be taken recreationally: finfish, red abalone, chiones, clams, cockles, rock scallops, native oysters, crabs, lobsters, ghost shrimp, sea urchins, mussels and marine worms except that no worms may be taken in any mussel bed unless taken incidentally to the take of mussels.

Only the following species may be taken commercially: finfish, crabs, ghost shrimp, jackknife clams, sea urchins, algae (except giant kelp and bull kelp) and worms except that no worms may be taken in any mussel bed, nor may any person pick up, remove, detach from the substrate any other organisms, or break up, move or destroy any rocks or other substrate or surfaces to which organisms are attached.

Primary objectives: This site met the criteria for State Park-Underwater Park established by the California State Parks and Recreation Commission. These criteria include marine area natural, recreational, cultural, and scenic underwater resources, as well as its proximity to an established terrestrial park. The Department of Parks and Recreation's General Plan of 1994 states "Underwater resources offshore at Van Damme State Park are of statewide significance including diverse habitats associated with tidepools, numerous rock sea stacks, and diverse underwater topography. Biologically this area is valuable due to the diversity of habitats and marine invertebrates."

Existing enforcement: The area is currently patrolled by State Park rangers and Department wardens.

Baseline and ongoing monitoring and research studies: The Department of Parks and Recreation conducts underwater biotic inventories of its underwater park units and accompanying species lists are available (DeMartini1990). In response to the Marine Life Protection Act and the Marine Managed Areas Improvement Act, The Department of Parks and Recreation is currently reviewing and evaluating State Park Underwater Parks and Reserves. This area has been the site of several baseline and ongoing studies conducted by The Department throughout the years, most notably red sea urchin, *Strongylocentrotus franciscanus*, red abalone, *Haliotis rufescens* and bull kelp, *Nerocystis luetkeana*.

Basic Evaluation: The area presently offers little in the way of resource protection since only certain invertebrates are protected from harvest. However, Van Damme is a highly used marine area providing recreation, education, and research opportunities. Several shallow- water reefs are easily accessible either by swimming from shore or using small watercraft, which can be easily launched from Van Damme beach. This MPA is one of the most popular destinations in the state for recreational abalone diving and shore-picking and is often the site of dive-club organized spearfishing competitions. This

area is also easily accessed by commercial fishermen and sea urchin divers from the nearby fishing ports of Albion and Fort Bragg. The boundaries of the existing area are currently difficult to recognize.

Published references related to use of this MPA as a research tool: 36, 44, 63, 79, 80, 81, 82, 83, 84

Site name: Manchester and Arena Rock State Marine Conservation Area

Year established: 1970

Approximate Area: 3.95 nm² **Approximate Shoreline length:** 3.23 nm

Approximate Depth range (feet): 0 to 125

Habitat types: Sandy bottom dominates with exposed wash rock and rocky pinnacles.

Surrounding habitat types: This coastline is notable for its unique geomorphology. The San Andreas Fault re-enters the ocean at the mouth of Alder Creek at the northern boundary of the MPA. The coastline above this point is characterized by steep headlands with accompanying narrow bands of rocky intertidal, a subtidal substrate of mixed soft and hard bottom, and numerous nearshore rock islands. Coastal streams have cut through the marine terrace at various points creating wetland and riparian habitat and pockets of sandy beaches. Directly to the south at Arena Cove and Mote Creek are highly productive intertidal reefs composed of sedimentary rock. Large portions of sand beach are also found in this area. Offshore of Iversen Point, approximately 10 miles south of Point Arena, is Saunders Reef which contains one of the largest stands of bull kelp, *Nerocystis luetkeana*, along the north coast.

Summary of existing regulations:

Only the following species may be taken recreationally: finfish, red abalone, chiones, clams, cockles, rock scallops, native oysters, crabs, lobsters, ghost shrimp, sea urchins, and marine worms except that no worms may be taken in any mussel bed unless taken incidentally to the take of mussels.

Only the following species may be taken commercially: finfish, crabs, ghost shrimp, jackknife clams, sea urchins, algae (except giant kelp and bull kelp) and worms except that no worms may be taken in any mussel bed, nor may any person pick up, remove, detach from the substrate any other organisms, or break up, move or destroy any rocks or other substrate or surfaces to which organisms are attached.

Primary objectives for establishment of site: This site was originally designated as a State Park and State Underwater Park. State parks are designated to preserve outstanding natural, scenic, and cultural values, indigenous aquatic and terrestrial fauna and flora, and the most significant examples of such ecological regions. (Public Resources Code 5019.53 and Title 14, Section 4752)

Existing enforcement: The Department of Parks and Recreation works in cooperation with the Department of Fish and Game, assimilating its regulations in the state park system.

Baseline and ongoing monitoring and research studies: The State Parks System conducts periodic resource evaluations.

Basic Evaluation: The subtidal habitat consists of primarily sandy bottom, with the exception of the Arena Rock area. The primary objective in originally establishing this site as a state park was to preserve a significant example of the geomorphology within this ecological region. This goal, separate from any biological goal, is met under the current designation. Enforcement in this region is generally difficult due to the remoteness of the site but can be accomplished with the Department's long-range patrol vessels.

SONOMA COUNTY

Site name: Del Mar Landing State Marine Park

Year established: 1972

Approximate Area: 0.06 nm²

Approximate Shoreline length: 0.6 nm

Approximate Depth range (feet): 0 to 42

Habitat types: Primarily rocky subtidal habitat

Surrounding habitat types: To the north, south, and offshore are rocky subtidal habitat, and some sandy areas.

Summary of existing regulations: Take of all living marine resources is prohibited except the recreational take of finfish by hook and line or spear.

Primary objectives: This area was originally designated as an ecological reserve. Fish and Game Code Section 1580 (ecological reserves) states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and non-marine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to ecological reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Enforcement is difficult due to the remoteness of the area.

Baseline and ongoing monitoring and research studies: No baseline or ongoing monitoring or research has occurred or does occur.

Basic Evaluation: Thus far, very little study specific to the efficacy of this area as a marine protected area has been pursued.

Site name: Salt Point State Marine Conservation Area

Year established: 1970

Approximate Area: 1.24 nm²

Approximate Shoreline length: 3.5 nm

Approximate Depth range (feet): 0 - 222

Overlapping area: Gerstle Cove State Marine Conservation Area

Habitat types: The area contains exposed and sheltered coastline with mostly hard bottom, and includes numerous wash rocks and rock shelves interspersed with gravel/sandy bottom. The substrate is primarily Franciscan sandstone and shale parent rock.

Surrounding habitat types: The surrounding area contains primarily gravel/sandy bottom with rocky outcroppings.

Summary of existing regulations:

Only the following species may be taken recreationally: finfish, red abalone, chiones, clams, cockles, rock scallops, native oysters, crabs, lobsters, ghost shrimp, sea urchins, mussels and marine worms except that no worms may be taken in any mussel bed unless taken incidentally to the take of mussels.

Only the following species may be taken commercially: finfish, crabs, ghost shrimp, jackknife clams, sea urchins, algae (except giant kelp and bull kelp) and worms except that no worms may be taken in any mussel bed, nor may any person pick up, remove, detach from the substrate any other organisms, or break up, move or destroy any rocks or other substrate or surfaces to which organisms are attached.

Primary objectives: This site was originally designated as a State Park. State parks are designated to preserve outstanding natural, scenic, and cultural values, indigenous aquatic and terrestrial fauna and flora, and the most significant examples of such ecological regions (Public Resources Code 5019.53 and Title 14, Section 4752, CCR). The Department of Parks and Recreation's General Plan states "the primary purpose of Salt Point State Park is to preserve the outstanding scenic, scientific, natural, and cultural values found on the Sonoma Coast, including offshore areas..."

Existing enforcement: Long-term cooperative enforcement between State Park Rangers, State Fish and Game Wardens and Sonoma County Sheriff Deputies.

Baseline and ongoing monitoring and research studies: No quantitative studies have been conducted at Salt Point. The State Parks System Dive Team and the California Underwater Parks and Preserves Advisory Board have conducted numerous dives here starting in the late 1960s. Seltenrich and DeMartini (1979) reported on interpretation and management of Mendocino Headlands and Salt Point State Underwater Parks. They described the biota of various depths and physical environments. This report can be considered a qualitative baseline.

Basic Evaluation: Salt Point is a highly utilized recreational and commercial fishing area. Due to the number of people frequenting the area that are aware of the limited restrictions currently in place, the MPA functions to the extent of those regulations. Anecdotal references to increased numbers and size of individual species have varied from year to year, but in general speak to a positive effect relative to areas outside the MPA. Commercial Passenger Fishing Vessels commonly anchor in the MPA, shore-based anglers frequent the access points, and commercial urchin fishing activity also occurs in this

area. Rocky habitat, wash rocks and similar habitat lay both north and south of the current MPA boundaries.

Published references related to effectiveness of this MPA: 168

Published references related to use of this MPA as a research tool: 120, 121, 184, 212, 213

Site name: Gerstle Cove State Marine Conservation Area

Year established: 1971

Approximate Area: 0.01 nm² **Approximate Shoreline length:** 0.3 nm

Approximate Depth range (feet): 0 to 16

Overlapping area: Salt Point State Marine Conservation Area

Habitat types: Exposed wash rock, gravel/sandy bottom with rocky outcroppings.

Surrounding habitat types: Offshore rocks, rocky walls and boulders; gravel/sandy bottom locally dominant.

Summary of existing regulations: Take of all living marine resources is prohibited except the commercial take of finfish and algae (except giant kelp and bull kelp).

Primary objectives: Protection of an area representative of the ecological characteristics and aquatic organisms of the region.

Existing enforcement: Enforcement has been active in this area, but difficult. This is the major access point for multiple users of the surrounding stretch of coastline.

Baseline and ongoing monitoring and research studies:

The Department of Parks and Recreation conducts periodic resource evaluations.

Basic Evaluation: Anecdotal information suggests that current protection within the Gerstle Cove has enhanced and provided for increased abundance of individuals of a variety of species. Qualitative surveys conducted shortly after (3 years) the MPA was established indicated an increase in the abalone population within the MPA.

Unpublished references related to effectiveness of this MPA: 7

Site name: Fort Ross State Marine Conservation Area

Year established: 1970

Approximate Area: 0.17 nm² **Approximate Shoreline length:** 0.9 nm

Approximate Depth range (feet): 0 to 102

Habitat types: Exposed and sheltered coastline with mostly hard bottom; numerous wash rocks, rock shelves interspersed with gravel/sandy bottom. Franciscan sandstone and shale parent rock. Sandy bottom at 60 feet supports an unusual stand of eelgrass.

Surrounding habitat types: Sandy bottom with rocky outcroppings, offshore wash rocks.

Summary of existing regulations:

No recreational take of living or non-living marine resources is allowed except: finfish, red abalone, chiones, clams, cockles, rock scallops, native oysters, crabs, lobsters, ghost shrimp, sea urchins, mussels and marine worms except that no worms may be taken in any mussel bed unless taken incidentally to the take of mussels.

Commercial take of species other than giant kelp and bull kelp is allowed.

Primary objectives: This site was originally designated as a State Historic Park and State Underwater Park. State historic parks are established to preserve objects of historical, archaeological, and scientific interest, historic sites and places commemorating important persons or historic events (Public Resources Code 5019.59 and Title 14, Section 4751, CCR).

Existing enforcement: Long-term cooperative enforcement between State Park Rangers, State Fish and Game Wardens and Sonoma County Sheriff Deputies.

Baseline and ongoing monitoring and research studies: No quantitative studies have been conducted at Fort Ross. The State Parks System Dive Team and the California Underwater Parks and Preserves Advisory Board have conducted numerous dives here starting in the late 1960s. In 1981, the US Navy worked with the Department of Parks and Recreation (DPR) to document shipwreck sites using on board magnetometers; 14 sites were plotted. Navy and DPR divers recorded some sites with video cameras. These videos show the general biota of wreck sites. Marine scientists from Indiana University and the DPR have carefully documented this site over the last few years. Qualitative observations of the biota, video and still documentation is in progress.

Basic Evaluation: The primary objective in originally establishing this state historic park was the preservation of the various shipwreck sites in the area; preservation of these sites is achieved under the current status. The current regulations provide limited protection for the invertebrate species listed above, however this area does not function as a biological reserve. Fort Ross Cove is utilized regularly by Commercial Passenger Fishing Vessels. Two long-term diving rangers have reported substantial declines in rockfish populations over the past 20 years. Commercial urchin fishing currently occurs within the MPA boundaries, and could continue as it has had a positive effect on kelp establishment and overall biodiversity.

Published references related to use of this MPA as a research tool: 120, 183

Site name: Sonoma Coast State Marine Conservation Area

Year established: 1970

Approximate Area: 0.68 nm² **Approximate Shoreline length:** 4.2 nm

Approximate Depth range (feet): 0 to 26

Overlapping area: Bodega State Marine Reserve

Habitat types: Exposed coast with mostly hard bottom, rock shelves with gravel/sandy bottom interspersed.

Surrounding habitat types: Offshore wash rocks, rocky pinnacles and sandy bottom.

Summary of existing regulations:

No recreational take of living or non-living marine resources is allowed except: finfish, red abalone, chiones, clams, cockles crabs, ghost shrimp, mussels, native oysters, rock scallops, sea urchins and marine worms except that no worms may be taken in any mussel bed unless taken incidentally to the take of mussels.

Commercial take of species other than giant kelp and bull kelp is allowed.

Primary objectives: This site was originally designated a State beach. State beaches are designed in areas with frontage on the ocean or bays designed to provide swimming, boat, fishing, and other beach-oriented activities. (Public Resources Code 5019.56 and Title 14, Section 4753, CCR)

Existing enforcement: Long-term cooperative enforcement between State Park Rangers, State Fish and Game Wardens and Sonoma County Sheriff Deputies.

Baseline and ongoing monitoring and research studies: Many studies by UC Bodega Marine Laboratory, Sonoma State University and the College of Marin. A number of senior projects have been done along Sonoma Coast. Dr Gordon L. Chan, College of Marin, prepared a Marine Coastal Ecology Syllabus (1972) which focuses to the San Francisco Bay Region and useful as well for the Sonoma Coast.

Basic Evaluation: Maximum upwelling values for the west coast system consistently occur along the Sonoma and Mendocino coast. This seasonal process transports nutrient rich water from the deep ocean into the sunlit surface layers near shore. The Bodega Submarine Canyon heads in the southern part of Sonoma Coast State Marine Conservation Area and acts as a conduit of nutrient rich water. As upwelling occurs spring and summer, phytoplankton rich waters stimulates the growth of many organisms and produces a highly diverse and productive biota.

The primary objective in establishing this site, as stated above, was to provide for recreational activities, including fishing. The site fulfills this objective. However Sonoma Coast State Marine Conservation Area does not function as a marine protected area other than providing limited protection for invertebrate species. Commercial Passenger Fishing Vessels frequently utilize this area of coastline.

Site name: Bodega State Marine Reserve

Year established: 1965 (full protection established in 1999)

Approximate Area: 0.20 nm² **Approximate Shoreline length:** 1.0 nm

Approximate Depth range (feet): 0 to 36

Overlapping area: Sonoma Coast State Marine Conservation Area

Habitat types: Rocky outcrops in sandy bottom.

Surrounding habitat types: Exposed coastline, wash rocks, rocky bottom interspersed with sand.

Summary of existing regulations: All commercial and recreational take prohibited.

Primary objectives: Protection of marine plants and invertebrates.

Existing enforcement: Enforcement is effective because of the close proximity of the site to the Bodega Marine Laboratory.

Baseline and ongoing monitoring and research studies:

Bodega Marine Laboratory utilizes this MPA on a regular basis for research projects and observation.

Basic Evaluation: This MPA is relatively small and is the only existing MPA in the between Humboldt and Monterey counties which is entirely marine and which has complete protection for all marine organisms. Complete protection has only been afforded to this MPA, originally established as a Marine Life Refuge, since 1999, a relatively short time period in which to assess its function as a no-take MPA. However, several studies utilize the MPA as a comparative baseline for species protected from the effects of fishing (i.e., urchins, crab, and abalone). The current boundaries of the MPA are honored and generally accepted by users groups.

Published references related to effectiveness of this MPA: 14

Published references related to use of this MPA as a research tool: 13, 15, 114, 120, 121, 132, 133, 134, 150, 168, 169, 184, 211, 212, 213

NAPA COUNTY

Site name: Fagan Marsh State Marine Park

Year established: 1979

Approximate Area: 0.50 nm² **Approximate Shoreline length:** 5.95 nm

Approximate Depth range (feet): not available

Habitat types: Intertidal and estuarine

Surrounding habitat types: estuarine

Summary of existing regulations: Take of all living marine resources is prohibited except the recreational hook and line take of species other than marine aquatic plants. Only lightweight, hand-carried boats may be launched or operated within the park.

Primary objectives: This area was originally designated as an ecological reserve. Fish and Game Code Section 1580 (ecological reserves) states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and non-marine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to ecological reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Access to Fagan Marsh is difficult. There is no dedicated patrol, but it is patrolled by the Department of Fish and Game.

Baseline and ongoing monitoring and research studies: None found.

Basic Evaluation: Insufficient information for evaluation at this time.

MARIN COUNTY

Site name: Tomales Bay State Marine Park

Year established: 1973

Approximate Area: 0.58 nm² **Approximate Shoreline length:** 9.08 nm

Approximate Depth range (feet): not available

Habitat types: Intertidal marsh and estuarine

Surrounding habitat types: estuarine

Summary of existing regulations: Take of all living marine resources is prohibited except the recreational hook and line take of species other than marine aquatic plants. Only lightweight, hand-carried boats may be launched or operated within the Park.

Primary objectives: This area was originally designated as an ecological reserve. Fish and Game Code Section 1580 (ecological reserves) states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and non-marine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to ecological reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Tomales Bay State Marine Park is patrolled regularly by the Department of Fish and Game.

Baseline and ongoing monitoring and research studies: None found.

Basic Evaluation: Insufficient information for evaluation at this time.

Site name: Point Reyes Headlands State Marine Conservation Area

Year established: 1972

Approximate Area: 0.60 nm² **Approximate Shoreline length:** 3.5 nm

Approximate Depth range (feet): 0 to 85

Habitat types: Rocky intertidal and subtidal mixed with sandy bottom.

Surrounding habitat types: Mixture of sand and hard bottom offshore.

Summary of existing regulations: Take of all living marine resources is prohibited except the commercial take of finfish and algae other than giant kelp and bull kelp.

Primary objectives: Protection of invertebrates.

Existing enforcement: Enforcement has been difficult due to the lack of personnel active in the area, as well as the difficulty in distinguishing recreational from commercial fishing from shore.

Baseline and ongoing monitoring and research studies: Baseline data for individual species varies from data collected in 1931 (algae) to 1980 (salmonids). No baseline data for finfish. There have been no specific research projects related to its status as an MPA.

Basic Evaluation: There are no current studies that speak to the efficacy of this site as an MPA; the existing regulations provide limited protection for invertebrates in the nearshore (primary objective).

Published references related to use of this MPA as a research tool: 13, 213

Site name: Estero de Limantour State Marine Conservation Area

Year established: 1971

Approximate Area: 0.64 nm² **Approximate Shoreline length:** 10.15 nm

Approximate Depth range (feet): not available

Habitat types: Estuarine and marsh

Surrounding habitat types: Intertidal sandy bottom with rocky outcroppings interspersed.

Summary of existing regulations: Take of all living marine resources is prohibited except the commercial take of finfish and algae other than giant kelp and bull kelp.

Primary objectives: To protect estuarine habitat.

Existing enforcement: Enforcement at this site has been limited.

Baseline and ongoing monitoring and research studies: While no baseline studies have been conducted in this area, monitoring of the area is conducted regularly as part of the National Seashore.

Basic Evaluation: There are no studies reporting the efficacy of this area as an MPA. Although this MPA technically permits some commercial take, it functions as a defacto fully protected area from consumptive use.

Site name: Duxbury Reef State Marine Conservation Area

Year established: 1971

Approximate Area: 0.50 nm² **Approximate Shoreline length:** 3.8 nm

Approximate Depth range (feet): 0 to 13

Habitat types: Monterey shale, rocky intertidal and subtidal habitat.

Surrounding habitat types: Rocky intertidal and subtidal habitat interspersed with sand.

Summary of existing regulations:

Only the following species may be taken recreationally: Red abalone, Dungeness crab, rock crabs, rockfish (family Scorpaenidae), lingcod, cabezon, surfperch (family Embiotocidae), halibut, flounder, sole, turbot, salmon, kelp greenling, striped bass, steelhead, monkeyface-eel, wolf-eel, smelt, and silversides.

Commercial take of species other than giant kelp and bull kelp is allowed.

Primary objectives: Protect communities of a Monterey shale outcrop, especially the intertidal biota.

Existing enforcement: Enforcement is not effective due to lack of personnel in the area.

Baseline and ongoing monitoring and research studies: Dr. Gordon Chan of the College of Marin conducted several long-term categorical studies as well as a study of user effects on the invertebrate and algae population prior to the MPA designation. Floral and faunal surveys were done by the Gulf of the Farallones National Marine Sanctuary in 1996.

Basic Evaluation: The primary objective in establishing this area was to provide protection for invertebrate species while allowing hook-and-line fishing from shore. Due to local conservation education efforts, this MPA fulfills its initial objective to prohibit recreational take of invertebrate species except red abalone. Use of the area has evolved since the MPA designation and commercial harvest occurs on the reef and near the reef, possibly affecting the populations the original designation was designed to protect.

Published references related to effectiveness of this MPA: 27

Published references related to use of this MPA as a research tool: 26

Unpublished references related to use of this MPA as a research tool: 8

Site name: Corte Madera Marsh State Marine Park

Year established: 1976

Approximate Area: 0.69 nm² **Approximate Shoreline length:** 2.03 nm

Approximate Depth range (feet): 0 to 15

Habitat types: Intertidal marsh and estuarine

Surrounding habitat types: Estuarine

Summary of existing regulations: Take of all living marine resources is prohibited except the recreational hook and line take of species other than marine aquatic plants from shore only. Only lightweight, hand-carried boats may be launched or operated within the park. Swimming, wading, and diving are prohibited within the park.

Primary objectives: This area was originally designated as an ecological reserve. Fish and Game Code Section 1580 (ecological reserves) states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to ecological reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Corte Madera Marsh is patrolled regularly by the Department of Fish and Game.

Baseline and ongoing monitoring and research studies: None found.

Basic Evaluation: Insufficient information for evaluation at this time.

Site name: Marin Islands State Marine Park

Year established: 1993

Approximate Area: 0.42 nm² **Approximate Shoreline length:** 1.93 nm

Approximate Depth range (feet): 0 to 15

Habitat types: rocky intertidal

Surrounding habitat types: estuarine

Summary of existing regulations: Take of all living marine resources is prohibited except the recreational hook and line take of species other than marine aquatic plants from shore only. Boating, swimming, wading, and diving are prohibited within the park.

Primary objectives: This area was originally designated as an ecological reserve. Fish and Game Code Section 1580 (ecological reserves) states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to ecological reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Marin Islands is patrolled regularly by the Department of Fish and Game.

Baseline and ongoing monitoring and research studies: None found.

Basic Evaluation: Insufficient information for evaluation at this time.

SAN FRANCISCO COUNTY

Site name: Farallon Islands State Marine Conservation Area

Year established: 1991

Approximate Area: 13.3 nm² **Approximate Shoreline length:** 4.2 nm

Approximate Depth range (feet): 0 to 240

Habitat types: complex hard bottom habitat with varying degrees of relief.

Surrounding habitat types: A variety of complex habitats lie immediately adjacent to the MPA boundary. Farther to the east is the primarily soft-bottom portion of the Gulf of the Farallones. A short distance to the west, the continental shelf drops off rapidly.

Summary of existing regulations: Area closures prevent fishing within 300 feet of the shore of portions of Southeast Farallon Island and the four islets of the North Farallon Islands from March 15 through August 15 of each year. A five nautical mile per hour speed limit is in effect for all vessels within 1,000 feet of any shoreline of the above islands. Otherwise all other forms of legal take are allowed. Other restrictions currently limit recreational and commercial fishing in certain depths.

Primary objectives: This area was originally designated as an ecological reserve. Fish and Game Code Section 1580 (ecological reserves) states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to ecological reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

The Farallon Islands were designated specifically to protect populations of nesting marine birds and breeding marine mammals from noise associated with vessel traffic. The U.S. Fish and Wildlife Service (USFWS) wanted to prohibit fishing within 1 mile of shore of all of the Farallon Islands year-round, but a compromise was reached with fishing interests and the Department to establish seasonal closures closer to shore around some of the islands.

Existing enforcement: Department enforcement vessels patrol the area. Staff from the Point Reyes Bird Observatory (PRBO) are stationed on Southeast Farallon Island, under an agreement with USFWS. They monitor wildlife populations, and can notify enforcement personnel of potential violations.

Baseline and ongoing monitoring and research studies: Monitoring of marine bird and mammal populations is conducted by PRBO staff and the Gulf of the Farallones National Marine Sanctuary (GFNMS), with occasional assistance from the Environmental Protection Agency. PRBO has more than 30 years of data, beginning in 1971, on marine bird populations at the islands. Since 1993 GFNMS staff have been conducting intertidal surveys of invertebrate and algal populations three times a year. In 2005 GFNMS staff, in cooperation with the Partnership for Interdisciplinary Studies of Coastal Oceans, will establish a permanent intertidal monitoring station at Southeast Farallon Island. GFNMS staff have also conducted sporadic surveys of krill abundance in nearshore waters using hydroacoustic technology.

The U.S. Fish and Wildlife Service maintains historical records of marine bird and mammal populations at the islands. The Service also has a data base of disturbance to these populations from vessels.

Basic Evaluation: Although technically an MPA, this site offers no additional permanent protection to subtidal marine organisms above and beyond the relevant Fish and Game regulations. The seasonal area closures afford a greater degree of protection to marine birds and mammals from the aspect of behavioral disturbances and may provide protection to nearshore subtidal species.

Published references related to effectiveness of this MPA: 149, 187

Unpublished references related to effectiveness of this MPA: 22, 32, 36, 48, 77, 135, 186, 192.

Published references related to use of this MPA as a research tool: 1, 2, 5, 64, 73, 88, 89

Unpublished references related to use of this MPA as a research tool: 147, 148

SOLANO COUNTY

Site name: Peytonia Slough State Marine Park

Year established: 1976

Approximate Area: 0.62 nm² **Approximate Shoreline length:** 4.69 nm

Approximate Depth range (feet): not available

Habitat types: Intertidal and estuarine

Surrounding habitat types: estuarine

Summary of existing regulations: Take of all living marine resources is prohibited except the recreational hook and line take of species other than marine aquatic plants. Only lightweight, hand-carried boats may be launched or operated within the park.

Primary objectives: This area was originally designated as an ecological reserve. Fish and Game Code Section 1580 (ecological reserves) states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and non-marine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to ecological reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Peytonia Slough is patrolled occasionally.

Baseline and ongoing monitoring and research studies: None found.

Basic Evaluation: Insufficient information for evaluation at this time.

ALAMEDA COUNTY

Site name: Albany Mudflats State Marine Park

Year established: 1986

Approximate Area: 0.19 nm² **Approximate Shoreline length:** 1.78 nm

Approximate Depth range (feet): 0 to 15

Habitat types: Intertidal and subtidal mudflats

Surrounding habitat types: Estuarine and marsh

Summary of existing regulations: Take of all living marine resources is prohibited except the recreational hook and line take of species other than marine aquatic plants from shore only. Boating, swimming, wading, and diving are prohibited within the park.

Primary objectives: This area was originally designated as an ecological reserve. Fish and Game Code Section 1580 (ecological reserves) states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to ecological reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Albany Mudflats is patrolled regularly by the Department of Fish and Game.

Baseline and ongoing monitoring and research studies: None found.

Basic Evaluation: Insufficient information for evaluation at this time.

Site name: Robert W. Crown State Marine Conservation Area

Year established: 1980

Approximate Area: not available

Approximate Shoreline length: not available

Approximate Depth range (feet): not available

Habitat types: Intertidal and subtidal estuarine habitat consisting primarily of mudflats and sandy bottom.

Surrounding habitat types: Estuarine with sandy bottom

Summary of existing regulations:

Take of all living marine resources is prohibited except:

1. Finfish may be taken recreationally by hook and line only.
2. Finfish and kelp may be taken commercially.

Primary objectives: Protection of estuarine habitat

Existing enforcement: This area is part of regular patrol by the Department of Fish and Game as well as East Bay Regional Park Police and the Alameda Police Department.

Baseline and ongoing monitoring and research studies: None found.

Basic Evaluation: Insufficient information for evaluation at this time.

SAN MATEO COUNTY

Site name: Redwood Shores State Marine Park

Year established: 1976

Approximate Area: 0.36 nm² **Approximate Shoreline length:** 13.82 nm

Approximate Depth range (feet): not available

Habitat types: Intertidal estuarine

Surrounding habitat types: Intertidal estuarine and marsh

Summary of existing regulations: Take of all living marine resources is prohibited except the recreational hook and line take of species other than marine aquatic plants. Only lightweight, hand-carried boats may be launched or operated in within the park.

Primary objectives: This area was originally designated as an ecological reserve. Fish and Game Code Section 1580 (ecological reserves) states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to ecological reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Redwood Shores is patrolled regularly by the Department of Fish and Game.

Baseline and ongoing monitoring and research studies: None found.

Basic Evaluation: Insufficient information for evaluation at this time.

Site name: Bair Island State Marine Park

Year established: 1986

Approximate Area: 2.33 nm² **Approximate Shoreline length:** 18.43 nm

Approximate Depth range (feet): not available

Habitat types: Intertidal estuarine

Surrounding habitat types: estuarine

Summary of existing regulations: Take of all living marine resources is prohibited except the recreational hook and line take of species other than kelp from shore only. Boating, swimming, wading, and diving are prohibited within the Park. No person, except state and local law enforcement officers, fire suppression agencies and employees of the department in the performance of their official duties or persons possessing written permission from the department, shall enter this park during the period February 15 through May 20.

Primary objectives: This area was originally designated as an ecological reserve. Fish and Game Code Section 1580 (ecological reserves) states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to ecological reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Bair Island is patrolled regularly by the Department of Fish and Game.

Baseline and ongoing monitoring and research studies: The U.S. Fish and Wildlife Service manages this site for the Department. A GIS map of the area was recently completed.

Basic Evaluation: Insufficient information for evaluation at this time.

Site name: James V. Fitzgerald State Marine Park

Year established: 1969

Approximate Area: 0.58 nm² **Approximate Shoreline length:** 3.0 nm

Approximate Depth range (feet): 0 to 33

Habitat types: Rocky intertidal and subtidal Monterey shale.

Surrounding habitat types: Rocky reefs interspersed with sandy bottom.

Summary of existing regulations: Take of all living marine resources is prohibited except the recreational take by hook and line or spear of: rockfish (family Scorpaenidae), lingcod, surfperch (family Embiotocidae), monkeyface eel, rock eel, white croaker, halibut, cabezon, kelp greenling, and smelt (Families Osmeridae and Atherinidae).

Primary objectives: The shoreline and reef area has been of interest to biologists, preservationists, and collectors since as early as 1908. As a result of the popularity of the site, resource depletion has long been an issue. In an effort to protect the area, in the 1960's the County of San Mateo proposed that the State of California designate the area as a "state reserve". Legislation was approved for the reserve status in 1969.

Existing enforcement: Enforcement of this area is effective because of the combined resources available through the state, county and public. This is a high use area, despite the MPA status, because of its accessibility to the public.

Baseline and ongoing monitoring and research studies: Baselines are old (1975 and 1976) and major changes have occurred. Subsequent baseline study and baseline studies were published in 1993. Staff are now compiling new information and has written a Management Plan in respect of how people may use the area.

The San Mateo County Parks and Recreation Division is proposing a resource assessment project for Fitzgerald that will 1) determine the amount (if any) of resource degradation from visitation, fishing and gathering; 2) propose, relative to visitation, fishing and gathering, various actions that can best protect the terrestrial reserve and MPAs natural resources; and 3) evaluate how (if at all) these actions will affect those who visit, fish and gather at Fitzgerald. As of 2004, new studies are underway to determine historical and existing levels of recreational take of the monkeyface prickleback, an important intertidal fish.

Basic Evaluation: Areas within the MPA that are remote from access as well as areas that are policed often function to protect species as originally intended. However, this is a high use area in which the primary concern is user access hampering resource protection. The area has both enforcement resources and public support.

Published references related to effectiveness of this MPA: 17, 126

MONTEREY COUNTY

Site name: Elkhorn Slough State Marine Reserve

Year established: 1980

Approximate Area: 1.7 nm²

Approximate Shoreline length: 2.7 nm

Approximate Depth range (feet): 0 to 10

Habitat types: Estuary with soft bottom

Surrounding habitat types: Similar estuarine soft bottom habitat.

Summary of existing regulations: No take is allowed both through State regulations and designation as a Federal National Estuarine Research Reserve.

Primary objectives: This area was originally designated as an ecological reserve. Fish and Game Code Section 1580 (ecological reserves) states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to ecological reserves in marine areas, the Fish and Game Commission has extended this policy to those areas. The Elkhorn Slough Ecological Reserve was established to protect sensitive salt marsh, mudflat, and open water habitats, and to provide a quality, undisturbed estuarine site for education, restoration, research and monitoring.

Existing enforcement: The area is easily-observed, well-known, almost surrounded by land, and has a Department of Fish and Game facility on site.

Baseline and ongoing monitoring and research studies: Monthly volunteer water quality monitoring since 1988 at 24 sites around the Slough, including the Reserve. Continuous water quality monitoring, using four sites (two on the Reserve), to measure temperature, salinity, turbidity, dissolved oxygen and pH. Hyperspectral images are being used to map the distribution of plant communities of interest (nuisance algae, eelgrass, pickleweed, native grasses, and noxious weeds). Tidal erosion rates at about 40 intertidal stations along the main channel and in the MPA are monitored annually.

Abundance, feeding rates, and reproductive success of herons, egrets, and cormorants in rookeries are assessed by volunteers. Caspian Tern breeding success is being monitored. Distribution, abundance, and diversity of shorebirds and waterbirds at seven ponds and tidal lagoons in the MPA are monitored to detect long-term changes or short-term anomalies. Native and invasive crabs are monitored along the estuarine gradient, in areas of different land use. Tracking of shark and ray abundances occurs at one site in the MPA.

Current research includes: 1) Investigation of use of mudflats and other intertidal habitats by shorebirds, and the influence of tidal and seasonal dynamics. 2) Comparison of invertebrate communities associated with native oyster beds vs. invasive tubeworm beds. 3) Experiments and time series analysis to determine whether invasive upland plants are invading the ecotone and high marsh.

Basic Evaluation: With on-site presence of Department staff, and with a history of baseline monitoring and research studies, the site functions well as one of the few fully-protected estuarine areas in the state.

Published references related to effectiveness of this MPA: 214, 217

Unpublished references related to effectiveness of this MPA: 21

Published references related to use of this MPA as a research tool: 20, 67, 188, 202

Site name: Hopkins State Marine Reserve

Year established: 1984

Approximate Area: 0.15 nm²

Approximate Shoreline length: 0.95 nm

Approximate Depth range (feet): 0 to 60

Habitat types: Mostly granite reef; smaller portions of sand, especially on outside edge

Surrounding Habitat types: Similar

Summary of existing regulations: No take is allowed.

Primary objectives: The primary purpose is to allow for research in an area that is free of disturbance due to exploitation.

Existing enforcement: The area is easily-observed from shore, well-known, marked on the seaward boundary by buoys, and staff from the Hopkins Marine Station is on site every day.

Baseline and ongoing monitoring and research studies: Numerous studies of algae, invertebrates, and fish have taken place. Long-term monitoring of the intertidal zone dates back to the 1930=s. The Department carried out relatively intensive fish counts, and some re-monitoring of those counts has taken place. A recent study was completed comparing counts and sizes of benthic fishes in and adjacent to the MPA. In addition, the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) has had permanent intertidal and subtidal monitoring sites here for several years.

Basic Evaluation: The area contains one of the oldest fully-protected marine research sites in the state and contains a variety of shallow habitat types within a relatively small area. It is a classic example of how a small but fully protected MPA can function well by providing a multitude of research opportunities with populations of marine organisms occurring at natural densities and size frequencies. While it is relatively small, studies have documented significantly greater biomass and size frequencies of nearshore fishes compared with adjacent fished areas. This site is overlapped by a State Water Quality Protection Area designation.

Published references related to effectiveness of this MPA: 31, 112, 117, 137, 141, 171, 174, 22

Unpublished references related to effectiveness of this MPA: 136

Published references related to use of this MPA as a research tool: 16, 40, 53, 75, 113, 170, 177, 183, 191, 192, 203, 209

Unpublished references related to use of this MPA as a research tool: 4, 52, 76

The Hopkins Marine Station web site presently lists more than 150 student papers dating back to 1964, most of which involved at least some field work or collection of organisms with HMLR. The web site address is: <http://www.marine.stanford.edu/HMSweb/marine-indexes.html>

Site name: Pacific Grove State Marine Conservation Area

Year established: 1984

Approximate Area: 1.2 nm²

Approximate Shoreline length: 2.5 nm

Approximate Depth range (feet): 0 to 60

Habitat types: Mostly granite reef; smaller portions of sand, especially on outside edge. Rock reefs in deeper water have been surveyed by submersibles.

Surrounding habitat types: Similar, except higher proportion of sand bottom offshore.

Summary of existing regulations:

Only the following species may be taken recreationally: finfish, and invertebrates other than mollusks or crustaceans.

Only the following species may be taken commercially by ring net, lampara net, or bait net: sardines, mackerel, anchovies, squid, and herring.

Primary objectives: Established by legislative action, the primary objective is to provide protection from exploitation for certain fishes and invertebrates.

Existing enforcement: The area is easily-observed from shore by law enforcement personnel as well as private citizens, is well-known, and benefits from an increased community awareness of the need to protect marine resources. During daylight hours thousands of people pass by or visit the area on a daily basis.

Baseline and ongoing monitoring and research studies: Many researchers from Department and several academic institutions have conducted life-history studies, recruitment studies, and tagging studies in this region. Tenera Environmental completed a study in 2003 which investigated the effects of visitor use on the intertidal area and established baseline levels of the more common intertidal species. Submersible studies of deeper-water fishes have also been carried out offshore of this site.

Basic Evaluation: The area presently offers some resource protection since regulations prohibit commercial finfishing (except for pelagic species) and allow the harvest of only certain invertebrates. Among the invertebrate species permitted for take, the presence of the sea otter precludes most harvest by man for some of these (e.g. urchin). However, the area does function well as an MPA by providing recreational opportunities, allowing a low but sustainable level of kelp and recreational finfish harvest, and providing a safe and local site for scientific collecting for research and public education. This area contains extensive intertidal and subtidal reef habitat and provides easy access to intertidal areas from shore. It also provides a source of kelp for local aquaculture businesses. Part of this site is overlapped by a State Water Quality Protection Area designation.

Unpublished references related to effectiveness of this MPA: 99, 100, 101, 118, 142, 195

Published references related to use of this MPA as a research tool: 130

Unpublished references related to use of this MPA as a research tool: 196

Site name: Carmel Bay State Marine Conservation Area

Year established: 1976

Approximate Area: 1.9 nm²

Approximate Shoreline length: 5.8 nm

Approximate Depth range (feet): 0 to 465

Habitat types: Granite reef along rocky shores; extensive areas of sand offshore; some granite pinnacles; head of Carmel submarine canyon

Surrounding habitat types: Similar except for the submarine canyon, which has greater depths than in the MPA.

Summary of existing regulations: Take of all living marine resources is prohibited except the recreational take of finfish by hook-and-line or spear and the commercial take of kelp under specific conditions.

Primary objectives: This area was originally designated as an ecological reserve. Fish and Game Code Section 1580 (ecological reserves) states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to ecological reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: The area is adjacent to population centers, and is therefore easily observed from shore. Pleasure boats, dive boats, and party boats frequent the area. Department provides enforcement presence on the water as well as from land.

Baseline and ongoing monitoring and research studies: The area near Pescadero Point, Stillwater Cove, and Arrowhead Point is the focus of a number of marine ecological studies, mostly through Moss Landing Marine Labs. San Francisco State University has conducted life-history and recruitment studies of fish in this area. A high school class carries out an ongoing monitoring program. There have also been submersible studies in the surrounding area. In addition, the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) has had permanent intertidal and subtidal monitoring sites here for several years.

Basic Evaluation: This area contains reef and sand habitat, a kelp bed, and includes the head of a submarine canyon. It provides opportunities for recreational angling and diving as well as limited commercial kelp harvest but is adjacent to the fully-protected area at Point Lobos. The existing degree of protection is probably consistent with its uses, and the site appears to function well as an MPA with limited harvest. The Department has documented its long term use as a fishing area for recreational anglers on Commercial Passenger Fishing Vessels and in skiffs as well as from extractive free divers (CenCal competitive free-diving competitions). This level of use appears to be sustainable in the absence of commercial fishing for finfish and invertebrates. The presence of the submarine canyon head provides a source of spot prawn recruitment to the commercial trap fishery in the adjacent area. This site is overlapped by a State Water Quality Protection Area designation.

Published references related to effectiveness of this MPA: 57, 175

Unpublished references related to effectiveness of this MPA: 43, 99, 100, 101, 104, 105, 115, 118, 175, 195

Published references related to use of this MPA as a research tool: 36, 66, 69, 70, 71, 74, 86, 90, 151, 181, 194, 204, 207

Unpublished references related to use of this MPA as a research tool: 4, 6, 23, 129, 180

Site name: Point Lobos State Marine Reserve

Year established: 1973

Approximate Area: 0.8 nm²

Approximate Shoreline length: 6.7 nm

Approximate Depth range (feet): 0 to 195

Habitat types: Mostly granite reef dropping from shore to sand bottom. Reef habitat with many crevices and pinnacles. Extensive kelp beds

Surrounding habitat types: Carmel submarine canyon is nearby. Extensive hard bottom offshore, as determined from submersible studies.

Summary of existing regulations: No take is allowed.

Primary objectives: This area was originally designated as an ecological reserve. Fish and Game Code Section 1580 (ecological reserves) states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to ecological reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: State Park rangers within the adjacent terrestrial reserve monitor access from shore, and monitor approaches by boats. The presence of visitors every day of the year in the adjacent terrestrial reserve provides an additional deterrent to potential violators of regulations.

Baseline and ongoing monitoring and research studies: UC Santa Cruz students found slightly greater abundances of benthic fish in the MPA than in adjacent areas. Department has conducted habitat-based surveys of fish abundance within the MPA. Submersible surveys have been carried out offshore of the MPA. In addition, the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) has had permanent intertidal and subtidal monitoring sites here for several years.

Basic Evaluation: This site contains a complex variety of habitats, primarily hard bottom, and contains high densities of large, adult bottom fishes such as rockfishes and lingcod. Although relatively small, the MPA functions well as a fully protected area because of its high species diversity and variety of habitat, and it is effectively enforced. Studies by the Department and others have documented high population densities and large sizes of economically important nearshore fish species, in particular rockfishes, lingcod, cabezon, and greenlings, with population densities and size frequencies significantly greater than in adjacent and more distant fished areas. In addition, the site is a prime destination for non-extractive scuba divers, and use is limited by local policy. This site is overlapped by a State Water Quality Protection Area designation.

Published references related to effectiveness of this MPA: 12, 72, 111, 137, 167, 198

Unpublished references related to effectiveness of MPAs: 25, 44, 46, 99, 100, 101, 102, 103, 131, 136, 152, 154, 190

Published references related to use of this MPA as a research tool: 58, 59, 78

Unpublished references related to use of this MPA as a research tool: 24

Site name: Julia Pfeiffer Burns State Marine Conservation Area

Year established: 1970

Approximate Area: 2.1 nm²

Approximate Shoreline length: 4.0 nm

Approximate Depth range (feet): 0 to 710 for MPA boundary, which extends 6000 feet offshore, but site-specific regulations apply to the harvest of invertebrates only within 1000 feet from shore, which is approximately 60 feet deep.

Habitat types: Hard and soft bottom. Five sub-categories of habitat: 1) Giant kelp beds; 2) pinnacles and underwater cliffs; 3) Diopatra (worm) tube beds; 4) unstable gravel and boulder fields; 5) surge channels; Some pinnacles have up to 75 ft of vertical relief in over 50 ft horizontally.

Surrounding habitat types: Similar habitats are found to south. To the north, Partington Canyon extends close to shore. Offshore is a mixture of hard and soft bottom, with some depths exceeding 300 fathoms (1,800 ft) within 3 miles of shore.

Summary of existing regulations:

Only the following species may be taken recreationally: finfish, chiones, clams, cockles, rock scallops, native oysters, crabs, lobsters, ghost shrimp, sea urchins, mussels and marine worms except that no worms may be taken in any mussel bed unless taken incidentally to the take of mussels.

Only the following species may be taken commercially: finfish, crabs, ghost shrimp, jackknife clams, sea urchins, squid, kelp and worms except that no worms may be taken in any mussel bed, nor may any person pick up, remove, detach from the substrate any other organisms, or break up, move or destroy any rocks or other substrate or surfaces to which organisms are attached.

Primary objectives: This site was established to protect unique habitat primarily due to prevalence of outstanding wall and pinnacle communities. It contains the most extensive series of pinnacles and underwater cliffs along the Big Sur Coast.

Existing enforcement: Enforcement is aided by the lack of access to intertidal and subtidal area from shore (although fishing from shore occurs at Partington Point) due to park requirements to stay on trails. Department of Park and recreation staff provide on site presence. Department of Fish and Game provides on-water presence. Commercial and recreational harvest restrictions pertain to invertebrates only, and for those which might be taken illegally, access is difficult at best.

Baseline and ongoing monitoring and research studies: Moss Landing Marine Laboratories-extensive diving surveys from 1987 to 1989 with some follow-up in mid 1990's, related to impacts of the massive landslide and subsequent manipulations by Caltrans in 1983-84. Extensive qualitative surveys of plant, invertebrate, and fish communities in five sub-habitat types have been completed. Contacts: John Oliver, MLML, and Jim Barry, Department of Parks and Recreation. Side-scan sonar maps and data are available from the Department of Fish and Game. Surveys were completed by Rick Kvitek in 1994, 1995, 1997, and 1998.

Basic Evaluation: The area presently offers little in the way of resource protection since only certain invertebrates are protected from harvest. Among the allowable species, the presence of the sea otter precludes most harvest by man for some of these (e.g. crab, urchin) or the species is not found here (lobster). However, the area does function well by providing recreational opportunities. The

Department of Parks and Recreation has a long-term data base here, including information on habitat, fishes, invertebrates, and algae. At present, except for Big Creek State Marine Reserve, there are no other complete no-take areas between Pt. Lobos State Marine Reserve, and Vandenberg State Marine Reserve. The northern Boundary of Big Creek State Marine Reserve is about 5 miles from southern boundary of Julia Pfeiffer Burns State Marine Conservation Area. This site is overlapped by a State Water Quality Protection Area designation.

Unpublished references related to effectiveness of this MPA: 18, 100, 101, 104, 178

Site name: Big Creek State Marine Reserve

Year established: 1994

Approximate Area: 1.9 nm²

Approximate Shoreline length: 2.7 nm

Approximate Depth range (feet): 0 to 300

Habitat types: Soft intertidal: est. 10%; Hard intertidal: est. 90%; Soft subtidal: est. 18%; Hard subtidal: est. 82%; Soft shelf: est. 88%; Hard shelf: 12%; Kelp beds; many wash rocks and pinnacles.

Surrounding habitat types: To the north and south a mixture of hard and soft bottom with scattered kelp beds. Several heads of submarine canyons adjacent on seaward side.

Summary of existing regulations: No take is allowed. No disturbance of the bottom; no boats, diving or other use (boat transit only); public entry restricted.

Primary objectives: To satisfy requirements of the Marine Resources Protection Act of 1990 the Fish and Game Commission was required to establish four ecological reserves along the mainland coast. The Big Creek State Marine Reserve (originally named the Big Creek Marine Resources Protection Act Ecological Reserve) was one of the reserves established pursuant to the Act. The Act specified that the specific purpose of these reserves was "to provide for scientific research related to the management and enhancement of marine resources".

Existing enforcement: Full-time reserve manager provides on-site presence. Local users of adjacent areas (skiff fishermen), who are allowed access through the MPA, assist in insuring compliance with regulations. Department provides on-water enforcement presence.

Baseline and ongoing monitoring and research studies: Benthic habitat mapping and characterization: baseline information for entire reserve (Yoklavich, VenTresca). Mapping ocean currents and related hydrographic studies: ongoing research (C. Collins, F. Schwing). Benthic fish surveys: baseline research; deep (Yoklavich), subtidal (VenTresca, Paddock). Benthic Invertebrates; some baseline; intertidal (Pearse); subtidal (Mira Parks). Local Fishery (social aspects; Pomeroy, Smiley). PISCO long-term subtidal monitoring site (Carr)

Basic Evaluation: This site contains a variety of habitats with hard and soft substrates, including kelp beds, and is one of the few existing MPAs which extend to 50 fm depth. This site functions well as a completely protected area while allowing research, particularly the documentation of population densities of nearshore and offshore fishes. Studies by the Department, National Marine Fisheries Service, and others have quantified density and size frequency of populations of rockfishes, lingcod, cabezon, and other economically important finfishes within and outside the MPA boundaries, and have found significant numbers of large, reproductively mature fishes within as well as adjacent to this site. Populations of fishes in adjacent areas are of higher density than within fished areas closer to ports, primarily due to the remoteness of the areas and their difficult access from shore. If fishing pressure increases in the future in adjacent areas, the MPA will continue to serve as a baseline for indices of natural populations. The MPA benefits from the presence of an on-site manager and has excellent enforcement.

Published references related to effectiveness of this MPA: 54, 137, 144, 145, 198, 201, 215, 216

Unpublished references related to effectiveness of this MPA: 58, 59, 60, 64, 102, 103, 106, 115, 136, 139, 143, 152, 153, 154, 155, 156, 157, 158, 182, 196, 197, 210, 216

Published references related to use of this MPA as a research tool: 145, 146

SAN LUIS OBISPO COUNTY

Site name: Atascadero Beach State Marine Conservation Area

Year established: 1985

Approximate Area: 3.9 nm²

Approximate Shoreline length: 1.5 nm

Approximate Depth range (feet): 0 to 115

Habitat types: 100% soft bottom

Surrounding Habitat types: similar

Summary of existing regulations: Take of clams is prohibited. Take of other living marine resources is allowed.

Primary objectives: Protect Pismo clams from over harvest

Existing enforcement: Department provides enforcement from shore. The primary purpose of enforcement would be to prevent harvest of sub-legal size clams.

Baseline and ongoing monitoring and research studies: Transects sampled in winter by The Department to monitor recruitment of young.

Basic Evaluation: Otters have depleted the population of legal size clams to the extent that there are virtually no legal size clams to protect. Thus, the site no longer meets its primary objective.

Published references related to effectiveness of this MPA: 140

Unpublished references related to effectiveness of this MPA: 138

Site name: Morro Beach State Marine Conservation Area

Year established: 1985

Approximate Area: 4.9 nm²

Approximate Shoreline length: 1.9 nm

Approximate Depth range (feet): 0 to 115

Habitat types: 100% soft bottom

Surrounding habitat types: similar

Summary of existing regulations: Take of clams is prohibited. Take of other living marine resources is allowed.

Primary objectives: Protect Pismo clams from over harvest

Existing enforcement: Department provides enforcement from shore. The primary purpose of enforcement would be to prevent harvest of sub-legal size clams.

Baseline and ongoing monitoring and research studies: Transects sampled in winter by The Department to monitor recruitment of young.

Basic Evaluation: Otters have depleted the population of legal size clams to the extent that there are virtually no legal size clams to protect. Thus, the site no longer meets its primary objective.

Published references related to effectiveness of this MPA: 140

Unpublished references related to effectiveness of this MPA: 138

Site name: Pismo State Marine Conservation Area

Year established: 1977

Approximate Area: 0.05 nm²

Approximate Shoreline length: 0.3 nm

Approximate Depth range (feet): 0 to 16

Habitat types: 100% soft bottom

Surrounding habitat types: similar

Summary of existing regulations: Take of all invertebrates and marine aquatic plants is prohibited except the commercial take of algae other than giant kelp and bull kelp. Take of finfish is allowed.

Primary objectives: To establish baseline for sea otter impact to clam population

Existing enforcement: Department provides enforcement from shore. The primary purpose of enforcement would be to prevent harvest of sub-legal size clams.

Baseline and ongoing monitoring and research studies: Transects sampled by The Department in winter to monitor recruitment of young.

Basic Evaluation: Otters have depleted the population of legal size clams to the extent that there are virtually no legal size clams to protect. Thus, the site no longer meets its primary objective.

Published references related to effectiveness of this MPA: 140

Unpublished references related to effectiveness of this MPA: 138

Site name: Pismo-Oceano State Marine Conservation Area

Year established: 1985

Approximate Area: 11.9 nm²

Approximate Shoreline length: 4.6 nm

Approximate Depth range (feet): 0 to 115

Habitat types: 100% soft bottom

Surrounding habitat types: similar

Summary of existing regulations: Take of clams is prohibited. Commercial take of giant kelp and bull kelp is prohibited. Take of other living marine resources is allowed.

Primary objectives: Protect Pismo clams from over harvest

Existing enforcement: Department provides enforcement from shore. The primary purpose of enforcement would be to prevent harvest of sub-legal size clams.

Baseline and ongoing monitoring and research studies: Transects sampled in winter by The Department to monitor recruitment of young.

Basic Evaluation: Otters have depleted the population of legal size clams to the extent that there are virtually no legal size clams to protect. Thus, the site no longer meets its primary objective.

Published references related to effectiveness of this MPA: 140

Unpublished references related to effectiveness of this MPA: 138

SANTA BARBARA COUNTY

Site name: Vandenberg State Marine Reserve

Year established: 1994

Approximate Area: 2.0 nm²

Approximate Shoreline length: 4.5 nm

Approximate Depth range (feet): 0 to 60

Habitat types: The area contains a mixture of hard and soft bottom. This is a high energy area that is likely heavily scoured.

Surrounding habitat types: Fairly similar to the north, south, and offshore, although a higher percentage of soft bottom to the north.

Summary of existing regulations: No take is allowed. No disturbance of bottom; no boats, diving or other use (boat transit only); public entry restricted. In offshore area outside boundaries a recent ban on gill nets was enacted legislatively.

Primary objectives: To satisfy requirements of the Marine Resources Protection Act of 1990 the Fish and Game Commission was required to establish four ecological reserves along the mainland coast. The Vandenberg State Marine Reserve (originally named the Vandenberg Marine Resources Protection Act Ecological Reserve) was one of the reserves established pursuant to the Act. The Act specified that the specific purpose of these reserves was "to provide for scientific research related to the management and enhancement of marine resources".

Existing enforcement: Access from land is restricted via Vandenberg Air Force Base security restrictions. This is a very remote location that is publicly inaccessible from land and sea.

Baseline and ongoing monitoring and research studies:

Benthic habitat mapping (Cochrane USGS). Mapping ocean currents and related hydrographic studies: ongoing research (Russ Vetter, NMFS). Eggs and larval fish surveys: research (Vetter, NMFS). Abalone enhancement, growth studies (Friedman, Haaker). Intertidal invertebrate surveys (PISCO-Pete Raimondi, UCSC; Steve Murray). Evaluation of effects of oil spill on intertidal (Pete Raimondi, UCSC; Andy Lisner, MMS). Some baseline data on fish abundance in the adjacent Purisima Point area exists from a Department research cruise in 1998.

Basic Evaluation: This site contains primarily shallow soft-bottom substrate but includes some low-relief subtidal reef. Based on Department surveys in the late 1990s, the site and the immediately adjacent area appear to function well in protecting high population densities of black abalone. The adjacent area, while not within an MPA, benefits from military-imposed restricted access. No other sites along the southern California mainland contain high densities of black abalone. An existing military closure near the area (Safety Zone 4) is enforced as a no-stopping area by the Air Force.

Unpublished references related to effectiveness of this MPA: 55

Published references related to use of this MPA as a research tool: 56, 205

CHANNEL ISLANDS MPAs MONITORING EFFORTS

The Department of Fish and Game has developed a detailed monitoring plan for the Channel Islands MPAs. These MPAs were established in 2003 and the area has a wealth of existing and ongoing monitoring. The Monitoring Plan and a detailed summary of existing monitoring programs are available on the web at:

http://www.dfg.ca.gov/mrd/channel_islands/monitoring.html

Baseline and ongoing monitoring and research studies: The following summary provides some background on ongoing activities that will help determine the effectiveness of these new MPAs.

The Channel Islands National Marine Sanctuary has been conducting aerial surveys of giant kelp along the entire shoreline of the Sanctuary on a quarterly basis since August 1999.

Channel Islands National Park has 16 fixed sites for the Kelp Forest Monitoring program, (est. 1982) and several Rocky Intertidal Monitoring sites (est. 1982, expanded 1985 for black abalone) at the islands. The Channel Islands National Marine Sanctuary has been conducting aerial surveys of giant kelp along the entire shoreline of the Sanctuary on a quarterly basis since August 1999.

The Reef Environmental Education Foundation has used volunteer divers since 1997 to collect information on the abundance and distribution of marine fishes at four sites within this MPA. The Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) has established a permanent site for a comprehensive, long-term monitoring study which focuses on recruitment and community structure of ca. 30 invertebrate and 10 fish species. In 2003 existing subtidal monitoring efforts were greatly increased to include study sites both inside and outside all Channel Islands MPAs.

From 1995 to 2000, the Marine Science Institute collected data at one site within the MPA, using midwater trawls, on pelagic fish and invertebrate assemblages, with a focus on rockfishes.

California Cooperative Oceanic Fishery Investigations (CalCOFI) has sites in and around the area that have been sampled since 1951. Sampling has varied from monthly to every three years and at present occurs annually. At each station a whole suite of physical and chemical measurements are made to characterize the environment; standard tows are conducted for phytoplankton, zooplankton, fish eggs, and fish larvae.

In 1998 and 2003 the Channel Islands National Marine Sanctuary collected data on the chemical composition of marine sediments, contaminant loads in marine fishes and invertebrates, and relative abundance of fish and invertebrate assemblages in a program called "Bight '98".

Humboldt State University has been monitoring population trends of the double-crested cormorant and Brandt's cormorant since 1991; the study will terminate in 2003. Annually since 1985, between March and September, the Channel Islands National Park has monitored the population dynamics of nine species of seabirds.

Since 1987, the National Marine Fisheries Service has conducted aerial photographic surveys to follow population trends of the California sea lion, Stellar sea lion, harbor seal, northern fur seal, and northern elephant seal.

Annually since 1968, the National Marine Mammal Laboratory of the Alaska fisheries Service Center (NMFS) has been monitoring the population dynamics of five species of pinnipeds (northern elephant seal, harbor seal, Guadalupe fur seal, northern fur seal, and California sea lion). Annually since 1982, the Department of Fish and Game has conducted one or two aerial surveys to estimate harbor seal abundance. Since 1986, Cascadia Research has been photographing blue and humpback whales from small boats and using suction cup tags to study population trends, movement, and stock structure. The Channel Islands National Marine Sanctuary and the Channel Islands National Park have developed an interpretive program called the Naturalist Corps, using trained volunteers to educate the public on excursion tours and to record sightings of marine mammals.

In 1997 the Channel Islands National Marine Sanctuary began weekly monitoring of whales and dolphins in relation to vessel traffic; the program is called the Sanctuary Aerial Monitoring Spatial Analysis Program (SAMSAP).

In 1997 the Channel Islands National Marine Sanctuary began a remote sensing program using orbital platforms, aerial transects, and opportunistic ROV tracks to monitor sea surface temperature, shoreline dynamics, and nearshore habitat.

The U.S. Geological Survey's Coastal and Marine Geology Program has mapped portions of the MPA using side scan sonar to depths of 100 m.

Deepwater submersible surveys have been conducted annually since 1995 at San Miguel Island and Santa Barbara Island by researchers at the Marine Science Institute of UC Santa Barbara. Fishes and macroinvertebrates are identified and quantified along with temperature, depth, and substrate.

A comprehensive ROV Survey of deeper habitats and species assemblages was completed in 2004 by the Department of Fish and Game.

Site name: Richardson Rock (San Miguel Island) State Marine Reserve

Year established: 2003

Approximate Area: 32.2nm²

Approximate Shoreline length: not applicable

Depth range (feet): 0 to 360

Habitat types: Richardson Rock is the most remote exposed offshore pinnacle in the region. The SMR contains only a few emergent offshore rocks with the majority of habitat underlying open water subject to the influence of seasonal upwelling. Subtidal habitat is mixed sand and rock. The area supports numerous cold-water fish and invertebrate species.

Surrounding habitat types: Surrounding habitats are deep rock and soft bottom with a similar high relief reef to the east at Wilson Rock.

Summary of existing regulations: No take is allowed.

Primary objectives: A state marine reserve by definition may achieve one or more of the following goals:

1. Protect or restore rare, threatened or endangered native plants, animals, or habitats in marine areas;
2. Protect or restore outstanding, representative, or imperiled marine species, communities, habitats, and ecosystems;
3. Protect or restore diverse marine gene pools;
4. Contribute to the understanding and management of marine resources and ecosystems by providing the opportunity for scientific research in outstanding, representative, or imperiled marine habitats or ecosystems.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. Channel Islands MPAs have been given a high priority for enforcement. A new, 54 foot, patrol vessel and several smaller vessels have been dedicated to Island patrols. National Park island rangers are present on San Miguel Island.

Baseline and ongoing monitoring and research studies: See Page 51 for Channel Islands Monitoring Efforts.

Basic Evaluation:

This is a recently established marine protected area. Refer to above review of baseline and ongoing monitoring and research studies.

Site name: Judith Rock (San Miguel Island) State Marine Reserve

Year established: 2003

Approximate Area: 5.1 nm² **Approximate Shoreline length:** 1.4 nm

Depth range (feet): 0 to 420

Habitat types: Shoreline from Adams Cove to Judith Rock is mixed rock and sand with moderate to high exposure. Sandy beaches are present near Point Bennett. Rocky intertidal habitat is very rich and diverse. Subtidal habitat is mixed rock and sand with moderate relief. Rocky reefs, with viable populations of red abalone and urchins, are interspersed with sand channels. Giant kelp populations between Adams Cove and Judith Rock are healthy and stable. The brown algae *Laminaria* is found in deeper waters, with patches of surfgrass occurring in shallow subtidal areas.

Surrounding habitat types: Similar habitats are found just to the east and west of this MPA. Farther east and offshore are scattered rock shelves and soft bottom.

Summary of existing regulations: No take is allowed.

Primary objectives: A state marine reserve by definition may achieve one or more of the following goals:

1. Protect or restore rare, threatened or endangered native plants, animals, or habitats in marine areas;
2. Protect or restore outstanding, representative, or imperiled marine species, communities, habitats, and ecosystems;
3. Protect or restore diverse marine gene pools;
4. Contribute to the understanding and management of marine resources and ecosystems by providing the opportunity for scientific research in outstanding, representative, or imperiled marine habitats or ecosystems.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. Channel Islands MPAs have been given a high priority for enforcement. A new, 54 foot, patrol vessel and several smaller vessels have been dedicated to Island patrols. National Park island rangers are present on the island.

Baseline and ongoing monitoring and research studies: See Page 51 for Channel Islands Monitoring Efforts.

Basic Evaluation:

This is a recently established marine protected area. Refer to above review of baseline and ongoing monitoring and research studies.

Site name: Harris Point (San Miguel Island) State Marine Reserve

Year established: 2003

Approximate Area: 18.2 nm²

Approximate Shoreline length: 6.3 nm

Depth range (feet): 0 to 300

Habitat types: Exposed sandy beaches cover the shore from the marker poles in Simonton Cove to Harris Point. Subtidal habitat off Simonton Cove is mostly sand with a few offshore reefs. From Harris Point to Bat Rock the shoreline is predominantly exposed rocky habitat with a few sandy coves; the rocky habitat once supported populations of black abalone. Subtidal habitat from Harris Point to Bat Rock is expansive rocky bottom, dominated by urchins, with a few high relief rocks and pinnacles. Giant kelp persists around Bat rock and inside of Harris Point.

The shoreline of Prince Island is rocky and exposed. The intertidal area descends quickly to rocky subtidal habitat, with persistent populations of giant kelp and surfgrass.

Surrounding habitat types: Habitats to the west include similar sand areas within the rest of Simonton Cove. Offshore a high relief rocky reef lies just to the west of the MPA. To the east habitats are primarily soft bottom farther offshore.

Summary of existing regulations: No take is allowed.

An exemption in the MPA, where commercial and recreational take of living marine resources is allowed, exists between the mean high tide line in Cuyler Harbor and a line between the following points:

34° 03.5' N. lat. 120° 21.3' W. long.;

34° 02.9' N. lat. 120° 20.2' W. long.

Special Regulations to protect marine mammals:

Boating is permitted at San Miguel Island except west of a line drawn between Judith Rock and Castle Rock where boats are prohibited closer than 300 yards from shore.

Boats may be anchored overnight only at Tyler Bight and Cuyler Harbor. Boats traveling within 300 yards of shoreline or anchorages shall operate with a minimum amount of noise and shall not exceed speeds of five miles per hour.

Landing is allowed on San Miguel Island by permit only at the designated landing beach in Cuyler Harbor. No person shall have access to all other offshore rocks and islands in the MPA.

1. Notwithstanding the 300-yard boating closure between Judith Rock and Castle Rock, the following shall apply:
 - a. Boats may approach San Miguel Island no nearer than 100 yards from shore during the period(s) from March 15 through April 30, and October 1 through December 15; and
 - b. Boats operated by commercial sea urchin boat operators who have been issued permits by the department to take sea urchins from the Point Bennett area of San Miguel Island may enter any waters of the 300-yard area between Judith Rock and Castle Rock for the purpose of fishing sea urchins during the period(s) March 15 through April 30, and October 1 through December 15.

2. The department may rescind permission for boats to enter waters within 300 yards between Judith Rock and Castle Rock upon finding that impairment to the island marine mammal resource is imminent. Immediately following such closure, the department will request the commission to hear, at its regularly scheduled meeting, presentation of documentation supporting the need for such closure.

Primary objectives: A state marine reserve by definition may achieve one or more of the following goals:

1. Protect or restore rare, threatened or endangered native plants, animals, or habitats in marine areas;
2. Protect or restore outstanding, representative, or imperiled marine species, communities, habitats, and ecosystems;
3. Protect or restore diverse marine gene pools;
4. Contribute to the understanding and management of marine resources and ecosystems by providing the opportunity for scientific research in outstanding, representative, or imperiled marine habitats or ecosystems.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. Channel Islands MPAs have been given a high priority for enforcement. A new, 54 foot, patrol vessel and several smaller vessels have been dedicated to Island patrols. National Park island rangers are present on the island.

Baseline and ongoing monitoring and research studies: See Page 51 for Channel Islands Monitoring Efforts.

Basic Evaluation: This is a recently established marine protected area. Refer to above review of baseline and ongoing monitoring and research studies.

Site name: South Point (Santa Rosa Island) State Marine Reserve

Year established: 2003

Approximate Area: 10.8 nm²

Approximate Shoreline length: 3.8 nm

Depth range (feet): 0 to 1,200

Habitat types: Moderately exposed, rocky coastline and intertidal area interspersed with isolated sandy coves and alleys. Subtidal habitat is mixed rocky reef, containing numerous crevices, with sand. Giant kelp populations are healthy and stable. Rocky subtidal areas support a variety of macroalgae species. Surfgrass occurs subtidally around South Point and patches of eelgrass occur in Johnson's Lee. Rocky intertidal once supported populations of black abalone, and rocky subtidal contains remnant populations of red and black abalone. The nearshore shelf drops off to sandy plateaus at about 70 feet. Two deeper reefs occur at South Point, at 90 feet and 120 feet.

Surrounding habitat types: Johnson's Lee includes shallow reef and sand habitats. To the west habitats are more similar to the western edge of this MPA, with mixed rocky reef and sand.

Summary of existing regulations: No take is allowed.

Primary objectives: A state marine reserve by definition may achieve one or more of the following goals:

1. Protect or restore rare, threatened or endangered native plants, animals, or habitats in marine areas;
2. Protect or restore outstanding, representative, or imperiled marine species, communities, habitats, and ecosystems;
3. Protect or restore diverse marine gene pools;
4. Contribute to the understanding and management of marine resources and ecosystems by providing the opportunity for scientific research in outstanding, representative, or imperiled marine habitats or ecosystems.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. Channel Islands MPAs have been given a high priority for enforcement. A new, 54 foot, patrol vessel and several smaller vessels have been dedicated to Island patrols. National Park island rangers are present on the island.

Baseline and ongoing monitoring and research studies: See Page 51 for Channel Islands Monitoring Efforts.

Basic Evaluation:

This is a recently established marine protected area. Refer to above review of baseline and ongoing monitoring and research studies.

Site name: Carrington Point (Santa Rosa Island) State Marine Reserve

Year established: 2003

Approximate Area: 13.3 nm²

Approximate Shoreline length: 5.3 nm

Depth range (feet): 0 to 180

Habitat types: Rocky exposed shoreline around Carrington Point, providing excellent habitat for seabirds. Rocky shoreline interspersed with protected sand beaches from Carrington Point to Bechers Bay. Rocky intertidal area dominated by urchins around Carrington Point, and by red and brown algae in Bechers Bay. Sand patches occur intermittently in the intertidal area. Subtidal habitat is comprised of low relief rocky reefs mixed with sand. Rocky subtidal habitat is found primarily around Carrington Point, Beacon Reef and Rhodes Reef. The former area supports unstable populations of giant kelp. Historically the area supported a large black abalone population. The area southeast of Carrington Point supports patchy populations of surfgrass, and a productive eel grass bed occurs in Bechers Bay.

Surrounding habitat types: Similar habitat is found at Rhodes Reef to the west and within Bechers Bay just south of the pier.

Summary of existing regulations: No take is allowed.

Primary objectives: A state marine reserve by definition may achieve one or more of the following goals:

1. Protect or restore rare, threatened or endangered native plants, animals, or habitats in marine areas;
2. Protect or restore outstanding, representative, or imperiled marine species, communities, habitats, and ecosystems;
3. Protect or restore diverse marine gene pools;
4. Contribute to the understanding and management of marine resources and ecosystems by providing the opportunity for scientific research in outstanding, representative, or imperiled marine habitats or ecosystems.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. Channel Islands MPAs have been given a high priority for enforcement. A new, 54 foot, patrol vessel and several smaller vessels have been dedicated to Island patrols. National Park island rangers are present on the island.

Baseline and ongoing monitoring and research studies: See Page 51 for Channel Islands Monitoring Efforts.

Basic Evaluation:

This is a recently established marine protected area. Refer to above review of baseline and ongoing monitoring and research studies.

Site name: Skunk Point (Santa Rosa Island) State Marine Reserve

Year established: 2003

Approximate Area: 1.4 nm²

Approximate Shoreline length: 2.7 nm

Depth range (feet): 0 to 60

Habitat types: Onshore, the region between Skunk Point and Abalone Point contains the only lagoon in the northern Channel Islands. Shoreline is sandy from Skunk Point to Abalone rocks. Shale ridges form scattered rocky reefs subtidally separated by large patches of sand. Persistent populations of giant kelp occur in rocky subtidal habitat between Abalone and East Points. Extensive populations of surfgrass occur south of Skunk Point toward East Point. South of Abalone Rocks, the subtidal habitat is mostly hard bottom. Rocky reefs support dense and stable populations of red urchins.

Surrounding habitat types: This shallow surfgrass habitat is unique in the immediate area. Surrounding habitats include shallow rock reef and soft bottom habitats farther offshore.

Summary of existing regulations: No take is allowed.

Primary objectives: A state marine reserve by definition may achieve one or more of the following goals:

1. Protect or restore rare, threatened or endangered native plants, animals, or habitats in marine areas;
2. Protect or restore outstanding, representative, or imperiled marine species, communities, habitats, and ecosystems;
3. Protect or restore diverse marine gene pools;
4. Contribute to the understanding and management of marine resources and ecosystems by providing the opportunity for scientific research in outstanding, representative, or imperiled marine habitats or ecosystems.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. Channel Islands MPAs have been given a high priority for enforcement. A new, 54 foot, patrol vessel and several smaller vessels have been dedicated to Island patrols. National Park island rangers are present on the island.

Baseline and ongoing monitoring and research studies: See Page 51 for Channel Islands Monitoring Efforts.

Basic Evaluation:

This is a recently established marine protected area. Refer to above review of baseline and ongoing monitoring and research studies.

Site name: Painted Cave (Santa Cruz Island) State Marine Conservation Area

Year established: 2003

Approximate Area: 2.1 nm²

Approximate Shoreline length: 2.0 nm

Depth range (feet): 0 to 300

Habitat types: Painted Cave is reputedly the largest sea cave off the coast of North America. Rocky cliffs around the cave drop sharply into the ocean. The intertidal zone is narrow, characterized by steep rocky walls descending into the subtidal. Bottom habitat is primarily sand and cobble.

Surrounding habitat types: Similar habitats are found to the east and west with multiple small sea caves. Offshore habitats are primarily sand and cobble.

Summary of existing regulations: No take of living, geological, or cultural resources is allowed except for the recreational take of spiny lobster (*Panulirus interruptus*) and pelagic finfish¹,

¹Pelagic Finfish are defined as: northern anchovy (*Engraulis mordax*), barracudas (*Sphyrna sp.*), billfishes** (family Istiophoridae), dolphinfish (*Coryphaena hippurus*), Pacific herring (*Clupea pallasii*), jack mackerel (*Trachurus symmetricus*), Pacific mackerel (*Scomber japonicus*), salmon (*Oncorhynchus spp.*), Pacific sardine (*Sardinops sagax*), blue shark (*Prionace glauca*), salmon shark (*Lamna ditropis*), shortfin mako shark (*Isurus oxyrinchus*), thresher sharks (*Alopias spp.*), swordfish (*Xiphias gladius*), tunas (family Scombridae), and yellowtail (*Seriola lalandi*). **Marlin is not allowed for commercial take.

Primary objectives: A state marine conservation area by definition may achieve one or more of the following goals:

1. Protect or restore rare, threatened or endangered native plants, animals, or habitats in marine areas;
2. Protect or restore outstanding, representative, or imperiled marine species, communities, habitats, and ecosystems;
3. Protect or restore diverse marine gene pools;
4. Contribute to the understanding and management of marine resources and ecosystems by providing the opportunity for scientific research in outstanding, representative, or imperiled marine habitats or ecosystems;
5. Preserve outstanding or unique geological features;
6. Provide for sustainable living marine resource harvest.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. Channel Islands MPAs have been given a high priority for enforcement. A new, 54 foot, patrol vessel and several smaller vessels have been dedicated to Island patrols. National Park island rangers are present on the island.

Baseline and ongoing monitoring and research studies: See Page 51 for Channel Islands Monitoring Efforts.

Basic Evaluation:

This is a recently established marine protected area. Refer to above review of baseline and ongoing monitoring and research studies.

Site name: Gull Island (Santa Cruz Island) State Marine Reserve

Year established: 2003

Approximate Area: 16.1 nm²

Approximate Shoreline length: 2.9 nm

Depth range (feet): 0 to 1,800

Habitat types: Predominant habitat along shore is sand beach, interspersed with cobble areas. Subtidal habitat is a mixture of sand and rocky reefs. Red and green algae dominate inshore areas. Kelp beds occur intermittently but are reduced from historic dimensions. Subtidal habitats once supported populations of red, pink, white, and black abalone. Rocky subtidal habitats are now dominated by urchins. Purple hydrocoral occurs on deeper rocky reefs. The shallow rocky habitat extends offshore to Gull Island. The SMR contains offshore emergent rocks, including Gull Island, which are excellent habitats for seabirds.

Surrounding habitat types: The habitat immediately surrounding Gull Island itself is fairly unique, high relief, not found elsewhere. Outside this MPA habitats are more similar to the areas inshore of Gull Island with sand beach, cobble, and rocky headlands.

Summary of existing regulations: No take is allowed.

Primary objectives: A state marine reserve by definition may achieve one or more of the following goals:

1. Protect or restore rare, threatened or endangered native plants, animals, or habitats in marine areas;
2. Protect or restore outstanding, representative, or imperiled marine species, communities, habitats, and ecosystems;
3. Protect or restore diverse marine gene pools;
4. Contribute to the understanding and management of marine resources and ecosystems by providing the opportunity for scientific research in outstanding, representative, or imperiled marine habitats or ecosystems.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. Channel Islands MPAs have been given a high priority for enforcement. A new, 54 foot, patrol vessel and several smaller vessels have been dedicated to Island patrols. National Park island rangers are present on the island.

Baseline and ongoing monitoring and research studies: See Page 51 for Channel Islands Monitoring Efforts.

Basic Evaluation: This is a recently established marine protected area. Fish populations in the vicinity of Gull Island are likely to respond to protection with increased density, individual size, and reproductive potential. In addition, refer to above review of baseline and ongoing monitoring and research studies.

Site name: Scorpion (Santa Cruz Island) State Marine Reserve

Year established: 2003

Approximate Area: 10.3 nm²

Approximate Shoreline length: 3.3 nm

Depth range (feet): 0 to 750

Habitat types: Rocky shoreline extends from Cavern Point to Potato Harbor. A small sandy beach occurs at Scorpion Anchorage. Emergent nearshore rocks and caves provide breeding and roosting sites for seabirds. Intertidal area is primarily rocky with some mixed sand and gravel beaches. Subtidal habitats are mixed sand and gravel with a few patchy, terraced reefs off Cavern Point. Eelgrass occurs in shallow sand and mud habitats, and feather boa kelp and surfgrass occur in shallow subtidal rocky areas. Giant kelp occurs but populations are unstable; rocky subtidal habitats are dominated by urchins. Some pinnacles and high relief rocky features are associated with caves and submerged rocky cliffs. Some pinnacles occur in deeper water.

Surrounding habitat types: Similar rocks, caves and cliffs are found immediately to the east and west. Deeper water substrate is primarily soft.

Summary of existing regulations: No take is allowed.

Primary objectives: A state marine reserve by definition may achieve one or more of the following goals:

1. Protect or restore rare, threatened or endangered native plants, animals, or habitats in marine areas;
2. Protect or restore outstanding, representative, or imperiled marine species, communities, habitats, and ecosystems;
3. Protect or restore diverse marine gene pools;
4. Contribute to the understanding and management of marine resources and ecosystems by providing the opportunity for scientific research in outstanding, representative, or imperiled marine habitats or ecosystems.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. Channel Islands MPAs have been given a high priority for enforcement. A new, 54 foot, patrol vessel and several smaller vessels have been dedicated to Island patrols. National Park island rangers are present on the island.

Baseline and ongoing monitoring and research studies: See Page 51 for Channel Islands Monitoring Efforts.

Basic Evaluation: This is a recently established marine protected area. Refer to above review of baseline and ongoing monitoring and research studies.

Site name: Refugio State Marine Conservation Area

Year established: 1998

Approximate Area: 0.93nm²

Approximate Shoreline length: 2.26 nm

Approximate Depth range (feet): 0 - 120

Habitat types: Low and mid-relief reefs in the inshore portion interspersed with sandy areas.

Surrounding habitat types: Similar to that in the site.

Summary of existing regulations:

Only the following species may be taken recreationally: finfish, chiones, clams, cockles, rock scallops, native oysters, crabs, lobsters, ghost shrimp, sea urchins, mussels and marine worms except that no worms may be taken in any mussel bed unless taken incidentally to the take of mussels.

Only the following species may be taken commercially: finfish, crabs, ghost shrimp, jackknife clams, sea urchins, kelp, squid and worms except that no worms may be taken in any mussel bed, nor may any person pick up, remove, detach from the substrate any other organisms, or break up, move or destroy any rocks or other substrate or surfaces to which organisms are attached.

Primary objectives: To provide additional protection to marine life and habitat within the state beach and to inform the public about the local marine life and need for protection.

Existing enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. State Park rangers, lifeguards and other staff provide added on-site enforcement presence.

Baseline and ongoing monitoring and research studies:

Basic Evaluation: This is a recently established marine protected area which will need future monitoring and evaluation.

Published and unpublished references: None found

Site name: Goleta Slough State Marine Park

Year established: 1981

Approximate Area: 0.51 nm² **Approximate Shoreline length:** not available

Approximate Depth range (feet): not available

Habitat types: Estuarine tidal lagoon and channels with salt marsh habitat

Surrounding habitat types: Coastal lowlands, bluffs, and beaches.

Summary of existing regulations: Take of all living marine resources is prohibited except the recreational hook and line take of species other than marine aquatic plants from designated areas. Boating, swimming, wading, and diving are prohibited within the MPA. No person, except department employees or designated employees of Santa Barbara Airport, City of Santa Barbara and Goleta Valley Mosquito Abatement District for the purposes of carrying out official duties shall enter this MPA and remain therein except on established trails, paths or other designated areas.

Primary objectives: This area was originally designated as an ecological reserve. Fish and Game Code Section 1580 (ecological reserves) states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to ecological reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area.

Baseline and ongoing monitoring and research studies: None found.

Basic Evaluation: Insufficient information for evaluation at this time.

Published and unpublished references: None found.

Site name: Santa Barbara Island State Marine Reserve

Year established: 2003

Area: 13.2 nm² **Shoreline length:** 1.0 nm

Depth range (feet): 0 to 1,800

Habitat types: Exposed rocky shoreline interspersed with cobble and sand beaches in protected coves. Rocky intertidal habitat drops off sharply offshore to patchy reefs in large areas of sand. Patches of surfgrass grow on subtidal rocks at 50 to 65-foot depths. Kelp beds are sparse, and urchins and brittle stars dominate the rocky subtidal habitats. Rocky subtidal habitat at 80 to 200 feet could support populations of white abalone. Continental shelf drops to about 660 feet within 0.5 miles of shore, and continues to drop to about 1300 feet within 3 miles of shore.

Surrounding habitat types: Similar habitats surround Santa Barbara Island. On the West side of the island there are exposed wash rocks.

Summary of existing regulations: No take is allowed.

Primary objectives: A state marine reserve by definition may achieve one or more of the following goals:

1. Protect or restore rare, threatened or endangered native plants, animals, or habitats in marine areas;
2. Protect or restore outstanding, representative, or imperiled marine species, communities, habitats, and ecosystems;
3. Protect or restore diverse marine gene pools;
4. Contribute to the understanding and management of marine resources and ecosystems by providing the opportunity for scientific research in outstanding, representative, or imperiled marine habitats or ecosystems.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. Channel Islands MPAs have been given a high priority for enforcement. A new, 54 foot, patrol vessel and several smaller vessels have been dedicated to Island patrols. National Park rangers are present on the island.

Baseline and ongoing monitoring and research studies: See Page 51 for Channel Islands Monitoring Efforts.

Basic Evaluation: This is a recently established marine protected area. Refer to above review of baseline and ongoing monitoring and research studies.

VENTURA COUNTY

Site name: Anacapa Island State Marine Reserve

Year established: 2003

Approximate Area: 11.7 nm²

Approximate Shoreline length: 3.3 nm

Depth range (feet): 0 to 600

Habitat types: Protected rocky shoreline interspersed with gravel beaches. Rocky habitat in intertidal area, broken by occasional patches of coarse sand, extends offshore to about 40 feet deep. There are numerous emergent rocks which provide roosting sites for seabirds. With the exception of the Anacapa Natural Area (now incorporated into the SMR), rocky subtidal reefs are dominated by urchins and brittle stars. Within the previously designated Natural Area is a lush kelp forest and a diverse assemblage of associated species. Patches of surfgrass grow on rocks in the subtidal area throughout the SMR, particularly in protected inlets. At about 60 feet, the continental shelf extends to low relief rubble and compacted sand. A large boulder field extends from about 80 to 100 feet. Muddy sloping terrain occurs near "Rickett's Rock".

Surrounding habitat types: Habitats are similar to those described in Anacapa SMCA below. Habitats on the south side of Anacapa include larger amounts of hard substrate in the deeper regions.

Summary of existing regulations: No take is allowed.

Primary objectives: A state marine reserve by definition may achieve one or more of the following goals:

1. Protect or restore rare, threatened or endangered native plants, animals, or habitats in marine areas;
2. Protect or restore outstanding, representative, or imperiled marine species, communities, habitats, and ecosystems;
3. Protect or restore diverse marine gene pools;
4. Contribute to the understanding and management of marine resources and ecosystems by providing the opportunity for scientific research in outstanding, representative, or imperiled marine habitats or ecosystems.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. Channel Islands MPAs have been given a high priority for enforcement. A new, 54 foot, patrol vessel and several smaller vessels have been dedicated to Island patrols. National Park island rangers are present on the island.

Baseline and ongoing monitoring and research studies: See Page 51 for Channel Islands Monitoring Efforts.

Basic Evaluation: This is a recently established marine protected area which also incorporates the only area within the Channel Islands (Anacapa Island Natural Area) which previously was fully protected. Data from the Natural Area suggest that this SMR can benefit greatly from protection in terms of increasing the density, spawning biomass, and individual size of resident fish populations. In addition, refer to above review of baseline and ongoing monitoring and research studies.

Site name: Anacapa Island State Marine Conservation Area

Year established: 2003

Approximate Area: 8.1 nm²

Approximate Shoreline length: 2.2 nm

Depth range (feet): 0 to 600

Habitat types: High relief rocky shoreline, increasingly exposed to the west. Eastern portion of shoreline is rocky, descending to broken reef and bolder fields at depths of about 80 feet. Western portion of shoreline is also rocky, descending rapidly to a steep muddy slope. Nearshore rocky habitats support patchy populations of giant kelp and surfgrass. A steep rocky reef occurs off the western tip of the island. The SMCA encompasses one of only two brown pelican breeding and fledging areas in North America.

Surrounding habitat types: See Anacapa SMR habitat description for habitat types to the east and south.

Summary of existing regulations: No take of living, geological, or cultural resources is allowed except for the recreational take of spiny lobster spiny lobster (*Panulirus interruptus*) and pelagic finfish¹ and the commercial take of spiny lobster.

No net or trap may be used in waters less than 20 feet deep off the Anacapa Islands commonly referred to as Anacapa Island.

A brown pelican fledgling area is designated from the mean high tide mark seaward to a water depth of 20 fathoms (120 feet) on the north side of West Anacapa Island between a line extending 000° True off Portuguese Rock (34° 00.91' N. lat. 119° 25.26' W. long.) to a line extending 000° True off the western edge of Frenchy's Cove (34° 00.4' N. lat. 119° 24.6' W. long.), a distance of approximately 4,000 feet. No person except department employees or employees of the National Park in the performance of their official duties shall enter this area during the period January 1 to October 31.

¹Pelagic Finfish are defined as: northern anchovy (*Engraulis mordax*), barracudas (*Sphyraena sp.*), billfishes** (family Istiophoridae), dolphinfish (*Coryphaena hippurus*), Pacific herring (*Clupea pallasii*), jack mackerel (*Trachurus symmetricus*), Pacific mackerel (*Scomber japonicus*), salmon (*Oncorhynchus spp.*), Pacific sardine (*Sardinops sagax*), blue shark (*Prionace glauca*), salmon shark (*Lamna ditropis*), shortfin mako shark (*Isurus oxyrinchus*), thresher sharks (*Alopias spp.*), swordfish (*Xiphias gladius*), tunas (family Scombridae), and yellowtail (*Seriola lalandi*). **Marlin is not allowed for commercial take.

Primary objectives: A state marine conservation area by definition may achieve one or more of the following goals:

1. Protect or restore rare, threatened or endangered native plants, animals, or habitats in marine areas;
2. Protect or restore outstanding, representative, or imperiled marine species, communities, habitats, and ecosystems;
3. Protect or restore diverse marine gene pools;
4. Contribute to the understanding and management of marine resources and ecosystems by providing the opportunity for scientific research in outstanding, representative, or imperiled marine habitats or ecosystems;

5. Preserve outstanding or unique geological features;
6. Provide for sustainable living marine resource harvest.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. Channel Islands MPAs have been given a high priority for enforcement. A new, 54 foot, patrol vessel and several smaller vessels have been dedicated to Island patrols. National Park island rangers are present on the island.

Baseline and ongoing monitoring and research studies: See Page 51 for Channel Islands Monitoring Efforts.

Basic Evaluation: This is a recently established marine protected area. Refer to above review of baseline and ongoing monitoring and research studies.

Site name: Big Sycamore Canyon State Marine Reserve

Year established: 1994

Approximate Area: 1.67 nm²

Approximate Shoreline length: 1.84 nm

Approximate Depth range (feet): 30 to 120

Habitat types: Sandy bottom 100%

Surrounding habitat types: Mostly sandy areas. Kelp forest and reef habitat at Deer Canyon to the east. Mugu Submarine Canyon to the west.

Summary of existing regulations: No take is allowed

Primary objectives: To satisfy requirements of the Marine Resources Protection Act of 1990 the Fish and Game Commission was required to establish four ecological reserves along the mainland coast. The Big Sycamore Canyon State Marine Reserve (originally named the Big Sycamore Marine Resources Protection Act Ecological Reserve) was one of the reserves established pursuant to the Act. The Act specified that the specific purpose of these reserves was "to provide for scientific research related to the management and enhancement of marine resources"

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. State Park rangers and lifeguards provide added on-site enforcement presence.

Baseline and ongoing monitoring and research studies: Habitat mapping surveys (sonar) conducted as part of MERRP research projects.

Basic Evaluation: Habitat here is almost entirely sand with no reef structure. As such, this site does not contain the large diversity of species and habitats that are present in many other MPAs. Despite these limitations, it is the only MPA which provides protection to an extensive area of this type of wide spread habitat in southern California. Halibut, a highly sought after species, are protected here, as well as a potential spawning area for market squid.

Unpublished references related to effectiveness of this MPA: 28, 206

Unpublished references related to use of this MPA as a research tool: 28, 206

LOS ANGELES COUNTY

Site name: Abalone Cove State Marine Park

Year established: 1977

Approximate Area: 0.09 nm²

Approximate Shoreline length: 1.01 nm

Approximate Depth range (feet): 0 to 30

Habitat types: Rocky outcrops, otherwise sand in the subtidal zone. Western shoreline is rocky with sand/cobble to the east.

Surrounding habitat types: Rocky points with kelp forest and reef habitat. Sandy coves and soft bottom areas offshore.

Summary of existing regulations: Take of all living marine resources is prohibited except the recreational take of finfish by hook and line or spear.

Primary objectives: This area was originally designated as an ecological reserve. Fish and Game Code Section 1580 (ecological reserves) states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to ecological reserves in marine areas, the Fish and Game Commission has extended this policy to those areas. A specific purpose of the Abalone Cove Ecological Reserve was to allow recreational take of finfish while protecting other biological and geological resources.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. Local park staff may provide added enforcement presence.

Baseline and ongoing monitoring and research studies: Miller and Lawrenze-Miller included this site in black abalone surveys of the Palos Verdes Peninsula.

Basic Evaluation: Provides limited protection to selected resources in an area currently subject to disturbance from terrestrial runoff, siltation and human use. Kelp restoration efforts at this area in the 1970s provided a source of recruitment for kelp recovery over much of the Palos Verdes Peninsula as water quality and habitat conditions improved. Red abalone recovered to relatively high numbers in this site during the 1980s as a result of successful natural recruitment, but declined severely by 1990 as habitat conditions deteriorated.

Published references related to use of this MPA as a research tool: 119

Unpublished references related to use of this MPA as a research tool: 68

Site name: Pt. Fermin State Marine Park

Year established: 1969

Approximate Area: 0.06 nm²

Approximate Shoreline length: 0.47 nm

Approximate Depth range (feet): 0 to 60 (estimated)

Habitat types: Complex, diverse habitats including rocky shore; kelp beds; surf grass beds; boulder and bedrock occur throughout this site.

Surrounding habitat types: Kelp forest and rocky reefs to the west and nearby offshore, soft bottom habitat to the east.

Summary of existing regulations: Take of all living marine resources is prohibited except the recreational take of: lobster, rockfish (family Scorpaenidae), greenling, lingcod, cabezon, yellowtail, mackerel, bluefin tuna, kelp bass, spotted sand bass, barred sand bass, sargo, croaker, queenfish, corbina, white seabass, opaleye, halfmoon, surfperch (family Embiotocidae), blacksmith, barracuda, sheephead, bonito, California halibut, sole, turbot, and sanddab.

Primary objectives: This area was originally designated as a marine life refuge. Although no specific objectives were provided for the marine life refuge designation, Fish and Game Code Section 10500 states that "Except under specific permit or authorization, it is unlawful: (f) To take or possess any invertebrate or specimen of marine plant life in a marine life refuge." In addition, individual marine life refuges may have been established for a variety of site specific of purposes. A specific purpose for the Point Fermin marine life refuge was to protect the rocky intertidal invertebrate and plant assemblages primarily for educational and aesthetic values.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. Local park staff, lifeguards and Cabrillo Aquarium staff who conduct educational and interpretive programs in the area may provide added enforcement presence.

Baseline and ongoing monitoring and research studies:

Rich Ambrose (UCLA) has established intertidal monitoring of intertidal plants and invertebrates. Historic algae surveys were performed in 1957-59 by E. Yale Dawson and were repeated in the late 1960s by T. Widdowson and in the 1970s and early 1980s by Ronald Thom and Leslie Harris. Amanda Gerrard and Steve Murray resurveyed Dawson=s transects at Point Fermin during spring 1999.

Basic Evaluation: Provides protection to most invertebrates, plants and some fishes. This is an easily accessible MPA for a large urban population and is adjacent to Cabrillo Marine Museum which conducts public education programs in the site. It would be a good site for future research and baseline monitoring. The MPA comprises diverse intertidal and subtidal assemblages and habitats that are valuable as an educational tool for the greater Los Angeles public. Area inside and outside the MPA is diverse, with kelp beds, sulfur pools and good rock habitats to the west.

Published references related to use of this MPA as a research tool: 38, 39, 189, 128, 208

Site name: Catalina Marine Science Center State Marine Reserve

Year established: 1988

Approximate Area: 0.06 nm²

Approximate Shoreline length: 1.08 nm

Approximate Depth range (feet): 0 to 120

Habitat types: Overall this site has about 50% hard and 50% soft substrates. Southwest of the pier is a soft-bottom cove with approximately 20 moorings for large boats. Southeast is a small soft-bottom cove. Within the small cove there are approximately 8 moorings for small research craft. Further southeast are rocky walls and hard bottom (to 30 m) and deeper soft bottom (to 100 m). The hard bottom habitat supports kelp forests.

Surrounding habitat types: Rocky shoreline, kelp forest and reefs adjacent to site. Some soft bottom areas offshore and in nearby coves. Extensive reef systems in nearby general area.

Summary of existing regulations: No take is allowed. No anchoring except in emergencies or as permitted by federal law.

Primary objectives: This area was originally designated as a marine life refuge. Although no specific objectives were provided for the marine life refuge designation, Fish and Game Code Section 10500 states that "Except under specific permit or authorization, it is unlawful: (f) To take or possess any invertebrate or specimen of marine plant life in a marine life refuge." In addition, individual marine life refuges may have been established for a variety of site specific purposes. A specific purpose for the Catalina Marine Science Center marine life refuge was to provide an area completely protected from take or other human disturbances for research activities associated with the adjacent marine science center.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. Local harbor patrol, lifeguards and employees and researchers from the Marine Science Center provide an added enforcement presence. There are signs and buoys to mark the area as well.

Baseline and ongoing monitoring and research studies: There have been numerous studies by scientific, volunteer and student researchers. The Catalina Conservancy Divers have long-term studies, especially for giant kelp. Published and gray literature in the Southern California Academy of Sciences Bulletin. Dr. Jack Engle of UCSB has conducted roving diver fish surveys during the last 3 or 4 years and is working with others to monitor rocky intertidal populations at Bird Rock. Mark Littler and Steve Murray established a site near Fisherman Cove as part of the BLM-sponsored studies in the mid-1970s. Steve Murray of CSU Fullerton has recently re-assessed the distributions and abundances of rocky intertidal populations to examine decadal scale changes in intertidal systems.

Basic Evaluation: Provides complete protection to all marine life in a semi-sheltered island habitat in the warm water region of the southern Channel Islands. It was established as a research site under control of the adjacent Wrigley Institute for Environmental Studies (WIES). WIES has become a popular educational and outreach center. It now subsidizes graduate student work and continues to support university researchers. The no-take MPA is vital to those operations. In addition, this site has strong research and monitoring potential to assess the effectiveness of no-take MPAs on resources since surrounding areas receive heavy recreational fishing pressure. Kelp bass and sheephead were

found in higher densities and larger sizes in this MPA compared with nearby areas open to harvest indicating that this MPA is protecting these desirable species to a greater extent than general fishery regulations elsewhere.

Published references related to use of this MPA as a research tool: 116, 122, 123, 124, 125, 126

Site name: Farnsworth Bank State Marine Conservation Area

Year established: 1972

Approximate Area: 0.06 nm²

Approximate Shoreline length: not available

Approximate Depth range (feet): 50 to 300

Habitat types: Rocky pinnacle, high relief with extensive colonies of purple hydrocoral.

Surrounding habitat types: Continuation of high relief pinnacle and reef habitat, boulder and reef debris in deeper areas with some sandy areas as well. Catalina Submarine Canyon nearby to the northwest.

Summary of existing regulations: Take of purple coral (*Stylaster californicus*) is prohibited. Take of other living marine resources is allowed.

Primary objectives: This area was originally designated as an ecological reserve. Fish and Game Code Section 1580 (ecological reserves) states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to ecological reserves in marine areas, the Fish and Game Commission has extended this policy to those areas. A specific purpose of the Farnsworth Bank State Marine Conservation Area is to protect dense populations of the hydrocoral, *Stylaster californicus*, and high relief pinnacles.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area.

Baseline and ongoing monitoring and research studies: Area of Special Biological Significance 1981 Report by SWRCB. 1972 bathymetric and biological survey by Mary Bergen. Submarine and ROV surveys for abalone conducted by the Department.

Basic Evaluation: Provides some protection to purple coral and marine plants in a portion of a unique high relief pinnacle habitat in the warm water region of the southern Channel Islands. Has potential as a site for white abalone restoration efforts.

Site name: Lover=s Cove State Marine Conservation Area

Year established: 1974

Approximate Area: 0.02 nm²

Approximate Shoreline length: 0.30 nm

Approximate Depth range (feet): 0 to 105

Habitat types: Composed of approximately 80% hard bottom. Giant kelp in shallow water.

Surrounding habitat types: Rocky and pebble shoreline adjacent to site. Sandy/soft bottom offshore.

Summary of existing regulations: Take of all living marine resources is prohibited except the commercial take of finfish and kelp.

Primary objectives: Although some harvest is officially allowed, all harvest and diving is unofficially prohibited by local authority. This small MPA adjacent to Avalon Cove is frequently used as a tourist destination for glass bottom boats, especially in the summer.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. Local harbor patrol, lifeguards and tour operators provide an added enforcement presence.

Baseline and ongoing monitoring and research studies: Surveyed by Dr. Milton Love's group.

Basic Evaluation: Provides de facto complete protection of all marine life. Heavily used as a tourist site for viewing relatively undisturbed and abundant nearshore reef marine life as a result of the high level of protection and observation. Kelp bass were at the same densities as areas outside this MPA but total biomass was several times greater (larger individual sizes) inside indicating that this MPA is protecting this desirable species to a greater extent than general fishery regulations elsewhere.

Published references related to effectiveness of this MPA: 3

ORANGE COUNTY

Site name: Bolsa Chica State Marine Park

Year established: 1973

Approximate Area: not available **Approximate Shoreline length:** not available

Approximate Depth range (feet): not available

Habitat types: Estuarine tidal lagoon and channels with salt marsh habitat.

This MPA will be greatly expanded in the near future with restoration to full, or partial, tidal influence to several hundred more acres and a new ocean inlet at the southern end of the site.

Surrounding habitat types: Coastal lowlands and bluffs, coastal beaches and urban development.

Summary of existing regulations: Take of all living marine resources is prohibited except the recreational hook and line take of species other than marine aquatic plants from designated areas around outer Bolsa Bay. Boating, swimming, wading, and diving are prohibited within the park. No person, except State and local law enforcement officers, fire suppression agencies and employees of the department in the performance of their official duties or persons possessing written permission from the department or employees of Signal Corporation and its invitees for the purpose of carrying out oil and gas operations, shall enter this park and remain therein except on established trails, paths, or other designated areas.

Primary objectives: This area was originally designated as an ecological reserve. Fish and Game Code Section 1580 (ecological reserves) states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and non-marine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to ecological reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area.

Baseline and ongoing monitoring and research studies: None found.

Basic Evaluation: Insufficient information for evaluation at this time.

Site name: Upper Newport Bay State Marine Park

Year established: 1975

Approximate Area: 0.64 nm² **Approximate Shoreline length:** 12.39 nm

Approximate Depth range (feet): not available

Habitat types: Estuarine bay with tidal channels, mud flats and salt marsh habitat.

Surrounding habitat types: Coastal lowlands and bluffs, and urban development.

Summary of existing regulations: Take of all living marine resources is prohibited except the recreational hook and line take of species other than kelp. Swimming is permitted only in the area between North Star Beach and mid-channel. Boats are limited to speeds less than five miles per hour. Shoreline access is limited to established trails, paths, or other designated areas.

Primary objectives: This area was originally designated as an ecological reserve. Fish and Game Code Section 1580 (ecological reserves) states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to ecological reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area.

Baseline and ongoing monitoring and research studies: None found.

Basic Evaluation: Insufficient information for evaluation at this time.

Site name: Robert E. Badham State Marine Park

Year established: 1968

Approximate Area: 0.02 nm²

Approximate Shoreline length: 0.61 nm

Approximate Depth range (feet): 0 to 10

Habitat types: Intertidal: sandy beach, rocky outcrop. Subtidal: patchy rock reef with sandy bottom.

Surrounding habitat types: Similar to the site. Rocky points and kelp forest reefs. Sandy areas in coves and offshore.

Summary of existing regulations: Take of all living marine resources is prohibited except the recreational take of: lobster, rockfish (family Scorpaenidae), greenling, lingcod, cabezon, yellowtail, mackerel, bluefin tuna, kelp bass, spotted sand bass, barred sand bass, sargo, croaker, queenfish, corbina, white seabass, opaleye, halfmoon, surfperch (family Embiotocidae), blacksmith, barracuda, sheephead, bonito, California halibut, sole, turbot, and sanddab.

Primary objectives: This area was originally designated as a marine life refuge. Although no specific objectives were provided for the marine life refuge designation, Fish and Game Code Section 10500 states that "Except under specific permit or authorization, it is unlawful: (f) To take or possess any invertebrate or specimen of marine plant life in a marine life refuge." In addition, individual marine life refuges may have been established for a variety of site specific purposes. This and several other marine life refuges along the Orange County coast were established in the late 1960's and 1970's to primarily protect intertidal (tidepool) organisms from collecting by the general public and large educational groups.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. City of Newport Beach has a decent program to lead visitors into the MPA and educate the public on sensitivity of the resources. City lifeguards may also provide an added enforcement presence.

Baseline and ongoing monitoring and research studies: Historic algae surveys were performed in 1957-59 by E. Yale Dawson. These were repeated in the late 1960s by T. Widdowson and in the 1970s and early 1980s by Ronald Thom. Steve Murray resurveyed Dawson's transects at Little Corona del Mar during spring 1999. Mark Littler established a site at Little Corona del Mar during the 1975-79 BLM-sponsored studies of rocky intertidal biota. Steve Murray of CSU Fullerton re-assessed the distributions and abundances of rocky intertidal populations at Little Corona Del Mar to examine decadal scale changes in intertidal systems.

Basic Evaluation: Provides some level of protection to invertebrates, plants and some fishes in a southern California coastal nearshore reef habitat. Heavy public use in the site and nearby, including illegal take and incidental trampling, and allowing most game species to be taken may have limited the effectiveness of protection. Enforcement presence often limited to times of highest use, while impacts incidental to visitation such as trampling are not the result of illegal activity. Local governments (Orange County Coastal Coalition) are interested in maintaining and increasing resource protection here.

Published references related to use of this MPA as a research tool: 38, 39, 189, 110, 128, 208

Unpublished references related to use of this MPA as a research tool: 107, 108, 109, 65

Site name: Crystal Cove State Marine Conservation Area

Year established: 1982

Approximate Area: 0.16 nm²

Approximate Shoreline length: 2.85 nm

Approximate Depth range (feet): 0 to 60

Overlapping area: Irvine Coast State Marine Park

Habitat types: Rocky platforms and sandy beaches. Extending out into the subtidal zone. As for most of this section of the coast, rocky benches are heavily sand influenced with rocky platforms and headlands separated by intermittent sandy pocket beaches. Most of the upper shoreline is sandy beach.

Surrounding habitat types: Similar to the site to the northwest with sandy beach and rocky points to the southeast. Sandy with scattered reefs offshore.

Summary of existing regulations:

Only the following species may be taken recreationally: finfish, chiones, clams, cockles, rock scallops, native oysters, crabs, lobsters, ghost shrimp, sea urchins, mussels and marine worms except that no worms may be taken in any mussel bed unless taken incidentally to the take of mussels.

Only the following species may be taken commercially: finfish, crabs, ghost shrimp, jackknife clams, sea urchins, algae (except giant kelp and bull kelp) and worms except that no worms may be taken in any mussel bed, nor may any person pick up, remove, detach from the substrate any other organisms, or break up, move or destroy any rocks or other substrate or surfaces to which organisms are attached.

Primary objectives: To provide additional protection to marine life and habitat within the MPA and to inform the public about the local marine life and need for protection.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. State Park rangers, lifeguards and other staff provide added on-site enforcement presence.

Baseline and ongoing monitoring and research studies: MMS-sponsored Shoreline Monitoring Program that follows abundances of key species and documents site changes at one rocky platform in the MPA; various Environmental Impact Reports have been prepared during the earlier period of MPA establishment and to support applications for onshore development projects. Historic algae surveys were performed in 1957-59 by E. Yale Dawson. These were repeated in the late 1960s by T. Widdowson and in the 1970s and early 1980s by Ronald Thom. Steve Murray resurveyed Dawson=s transects at Crystal Cove during spring 1999.

Basic Evaluation: Provides some level of protection to most invertebrates (except certain "game species") and plants in a southern California coastal nearshore reef habitat. Heavy public use within the site and nearby, including illegal take and incidental trampling, and allowing most game species to be taken may have limited the effectiveness of protection. Enforcement presence often limited to times of highest use, while impacts incidental to visitation such as trampling are not the result of illegal activity. This area encompasses the Irvine Coast State Marine Park so the level of protection in that portion (600 feet from shore) is actually greater than provided for by conservation area regulations.

The adjacent onshore area is being developed for residential and commercial uses which have the potential to increase uses and impacts to the marine resources in this MPA. Local governments (Orange County Coastal Coalition) are interested in maintaining and increasing resource protection here. The State Parks General Plan for this site recommends an area with more protective regulations be established off the Pelican Point area.

Published references related to effectiveness of this MPA: 122, 127

Unpublished references related to effectiveness of this MPA: 185, 87, 173

Published references related to use of this MPA as a research tool: 38, 39, 189, 127, 208

Unpublished references related to use of this MPA as a research tool: 185, 87, 172, 173

Site name: Irvine Coast State Marine Park

Year established: 1971

Approximate Area: 0.31 nm²

Approximate Shoreline length: 2.85 nm

Approximate Depth range (feet): 0 to 60

Overlapping area: Crystal Cove State Marine Conservation Area

Habitat types: Rocky platforms and sandy beaches. Extending out into the subtidal zone. As for most of this section of the coast, rocky benches are heavily sand influenced with rocky platforms and headlands separated by intermittent pocket sandy beaches. Most of the upper shoreline is sandy beach.

Surrounding habitat types: Similar to the site.

Summary of existing regulations: Take of all living marine resources is prohibited except the recreational take of: lobster, rockfish (family Scorpaenidae), greenling, lingcod, cabezon, yellowtail, mackerel, bluefin tuna, kelp bass, spotted sand bass, barred sand bass, sargo, croaker, queenfish, corbina, white seabass, opaleye, halfmoon, surfperch (family Embiotocidae), blacksmith, barracuda, sheephead, bonito, California halibut, sole, turbot, and sanddab.

Primary objectives: This area was originally designated as a marine life refuge. Although no specific objectives were provided for the marine life refuge designation, Fish and Game Code Section 10500 states that "Except under specific permit or authorization, it is unlawful: (f) To take or possess any invertebrate or specimen of marine plant life in a marine life refuge." In addition, individual marine life refuges may have been established for a variety of site specific purposes. This and several other marine life refuges along the Orange County coast were established in the late 1960's and 1970's to primarily protect intertidal organisms from collecting by the general public and large educational groups.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. State Park rangers, lifeguards and other staff provide an added on-site enforcement presence.

Baseline and ongoing monitoring and research studies: MMS-sponsored Shoreline Monitoring Program that follows abundances of key species and documents site changes at one rocky platform in the MPA; various Environmental Impact Reports have been prepared during the earlier period of MPA establishment and to support applications for onshore development projects. Historic algae surveys were performed in 1957-59 by E. Yale Dawson. These were repeated in the late 1960s by T. Widdowson and in the 1970s and early 1980s by Ronald Thom. Steve Murray resurveyed Dawson=s transects at Crystal Cove during Fall 1998.

Basic Evaluation: Provides some level of protection for most invertebrates, plants and some fishes in a southern California coastal nearshore reef habitat. Heavy public use within the site and nearby, including illegal take and incidental trampling, and allowing most game species to be taken may have limited the effectiveness of protection. Enforcement presence often limited to times of highest use, while impacts incidental to visitation such as trampling are not the result of illegal activity. Local governments (Orange County Coastal Coalition) are interested in maintaining and increasing resource protection here.

Published references related to effectiveness of this MPA: 122, 127

Unpublished references related to effectiveness of this MPA: 185, 87, 173

Published references related to use of this MPA as a research tool: 38, 39, 189, 127, 208

Unpublished references related to use of this MPA as a research tool: 185, 87, 172, 173

Site name: Laguna Beach State Marine Park

Year established: 1968, extended in 1993

Approximate Area: 0.09 nm²

Approximate Shoreline length: 0.75 nm

Approximate Depth range (feet): 0 to 60

Overlapping area: Heisler Park State Marine Reserve

Habitat types: Rocky platforms and sandy beaches. Extending out into the subtidal zone. As for most of this section of the coast, rocky benches are heavily sand influenced with rocky platforms and headlands separated by intermittent pocket sandy beaches. Some of the sandy beaches of Laguna are heavily used by tourists. Most of the upper shoreline along this stretch of coastline, except for headlands, is sandy beach.

Surrounding habitat types: Similar to site. Rocky points and subtidal reefs with extensive sandy beaches and coves.

Summary of existing regulations: Take of all living marine resources is prohibited except the recreational take of: lobster, rockfish (family Scorpaenidae), greenling, lingcod, cabezon, yellowtail, mackerel, bluefin tuna, kelp bass, spotted sand bass, barred sand bass, sargo, croaker, queenfish, corbina, white seabass, opaleye, halfmoon, surfperch (family Embiotocidae), blacksmith, barracuda, sheephead, bonito, California halibut, sole, turbot, and sanddab.

Primary objectives: This area was originally designated as a marine life refuge. Although no specific objectives were provided for the marine life refuge designation, Fish and Game Code Section 10500 states that "Except under specific permit or authorization, it is unlawful: (f) To take or possess any invertebrate or specimen of marine plant life in a marine life refuge." In addition, individual marine life refuges may have been established for a variety of site specific purposes. This and several other marine life refuges along the Orange County coast were established in the late 1960's and 1970's to primarily protect intertidal organisms from collecting by the general public and large educational groups.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. City of Laguna Beach lifeguards are trained in MPA regulations and will issue advisories and warnings, if needed. Orange County Sheriff Deputies are trained in MPA enforcement and devote some patrol time to this area.

Baseline and ongoing monitoring and research studies: MMS-sponsored Shoreline Monitoring Program that follows abundances of key species and documents site changes at two rocky platforms in the MLRS: Shaw=s Cove and Treasure Island; EIS work required for onshore developments will also result in some data of scientific value on coastal populations and conditions. Historic algae surveys were performed in 1957-59 by E. Yale Dawson at a site inside Heisler Park. These surveys were repeated in the late 1960s by T. Widdowson and in the 1970s and early 1980s by Ronald Thom. Steve Murray resurveyed Dawson=s transects at Laguna Beach during Fall 1998.

Basic Evaluation: Provides some level of protection for most invertebrates, all plants and some fishes in a southern California coastal nearshore reef habitat. Heavy public use within the site and nearby, including illegal take and incidental trampling, and allowing most game species to be taken may have

limited the effectiveness of protection. Enforcement presence often limited to times of highest use, while impacts incidental to visitation such as trampling are not the result of illegal activity. Local governments (Orange County Coastal Coalition) are interested in maintaining and increasing resource protection here.

Published references related to effectiveness of this MPA: 122, 127

Unpublished references related to effectiveness of this MPA: 185, 87, 172

Published references related to use of this MPA as a research tool: 127

Unpublished references related to use of this MPA as a research tool: 185, 87, 172, 173

Site name: Heisler Park State Marine Reserve

Year established: 1973

Approximate Area: 0.04 nm²

Approximate Shoreline length: 0.39 nm

Approximate Depth range (feet): 0 to 60

Overlapping area: Laguna Beach State Marine Park

Habitat types: Rocky platforms and sandy beaches. Extending out into the subtidal zone. As for most of this section of the coast, rocky benches are heavily sand influenced with rocky platforms and headlands separated by intermittent pocket sandy beaches. Main Beach in Laguna is very heavily used by tourists.

Surrounding habitat types: Similar to the site. Rocky points and benches, sandy coves with scattered offshore reefs.

Summary of existing regulations: No take is allowed. Boats may be launched and retrieved only in designated areas and may be anchored within the MPA only during daylight hours.

Primary objectives: This area was originally designated as an ecological reserve. Fish and Game Code Section 1580 (ecological reserves) states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to ecological reserves in marine areas, the Fish and Game Commission has extended this policy to those areas. A specific purpose of the Heisler Park Ecological Reserve was to completely protect from take, a portion of the local nearshore kelp forest habitat.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. City of Laguna Beach lifeguards are trained in MPA regulations and will issue advisories and warnings, if needed. Orange County Sheriff Deputies are trained in MPA enforcement and devote some patrol time to this area.

Baseline and ongoing monitoring and research studies: Historic algae surveys were performed in 1957-59 by E. Yale Dawson at a site inside Heisler Park. These surveys were repeated in the late 1960s by T. Widdowson and in the 1970s and early 1980s by Ronald Thom. Steve Murray resurveyed Dawson=s transects at Laguna Beach during Fall 1998.

Basic Evaluation: Provides complete protection to all marine life in a southern California coastal nearshore reef habitat. The site=s small size and heavy public use within the site and nearby areas appears to limit the effectiveness of protection. Despite these factors, barred sand bass and kelp bass had higher densities and larger sizes in this MPA than in nearby areas subject to harvesting pressure indicating that this site is protecting these desirable species to a greater extent than general fishery regulations alone in areas elsewhere. Local governments (Orange County Coastal Coalition) are interested in maintaining and increasing resource protection here.

Published references related to use of this MPA as a research tool: 38, 39, 189, 208

Site name: South Laguna Beach State Marine Park

Year established: 1968

Approximate Area: 0.05 nm²

Approximate Shoreline length: 0.52 nm

Approximate Depth range (feet): 0 to 60

Habitat types: Substrate in this site is approximately 50% hard and 50% soft with rocky points and sandy coves, some offshore rocks.

Surrounding habitat types: Similar to the site. Rocky points, sandy beaches and coves with some offshore rocks and reefs.

Summary of existing regulations: Take of all living marine resources is prohibited except the recreational take of: lobster, rockfish (family Scorpaenidae), greenling, lingcod, cabezon, yellowtail, mackerel, bluefin tuna, kelp bass, spotted sand bass, barred sand bass, sargo, croaker, queenfish, corbina, white seabass, opaleye, halfmoon, surfperch (family Embiotocidae), blacksmith, barracuda, sheephead, bonito, California halibut, sole, turbot, and sanddab.

Primary objectives: This area was originally designated as a marine life refuge. Although no specific objectives were provided for the marine life refuge designation, Fish and Game Code Section 10500 states that "Except under specific permit or authorization, it is unlawful: (f) To take or possess any invertebrate or specimen of marine plant life in a marine life refuge." In addition, individual marine life refuges may have been established for a variety of site specific purposes. This and several other marine life refuges along the Orange County coast were established in the late 1960's and 1970's to primarily protect intertidal organisms from collecting by the general public and large educational groups.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. City of Laguna Beach lifeguards are trained in MPA regulations and will issue advisories and warnings, if needed. Orange County Sheriff Deputies are trained in MPA enforcement and devote some patrol time to this area.

Baseline and ongoing monitoring and research studies: None found

Basic Evaluation: Provides some level of protection for most invertebrates, all plants and some fishes in a southern California coastal nearshore reef habitat. Heavy public use within the site and nearby, including illegal take and incidental trampling, within the site and nearby, and allowing most game species to be taken may have limited the effectiveness of protection. Enforcement presence often limited to times of highest use, while impacts incidental to visitation such as trampling are not the result of illegal activity. Local governments (Orange County Coastal Coalition) are interested in maintaining and increasing resource protection here.

Published references related to effectiveness of this MPA: 122, 127

Unpublished references related to effectiveness of this MPA: 185, 87, 173

Unpublished references related to use of this MPA as a research tool: 185, 87, 172, 173

Site name: Niguel State Marine Park

Year established: 1971

Approximate Area: 0.41 nm²

Approximate Shoreline length: 2.0 nm

Approximate Depth range (feet): 0 to 60

Habitat types: Substrate at this site is approximately 50% hard and 50% soft with some rocky points, offshore rocks and sandy beaches.

Surrounding habitat types: Rocky points and sandy coves to the north, major rocky headland (Dana Pt MLR) with extensive subtidal reefs to the south, Kelp forest and reef habitat and sandy areas offshore.

Summary of existing regulations: Take of all living marine resources is prohibited except the recreational take of: lobster, rockfish (family Scorpaenidae), greenling, lingcod, cabezon, yellowtail, mackerel, bluefin tuna, kelp bass, spotted sand bass, barred sand bass, sargo, croaker, queenfish, corbina, white seabass, opaleye, halfmoon, surfperch (family Embiotocidae), blacksmith, barracuda, sheephead, bonito, California halibut, sole, turbot, and sanddab.

Primary objectives: This area was originally designated as a marine life refuge. Although no specific objectives were provided for the marine life refuge designation, Fish and Game Code Section 10500 states that "Except under specific permit or authorization, it is unlawful: (f) To take or possess any invertebrate or specimen of marine plant life in a marine life refuge." In addition, individual marine life refuges may have been established for a variety of site specific purposes. This and several other marine life refuges along the Orange County coast were established in the late 1960's and 1970's to primarily protect intertidal organisms from collecting by the general public and large educational groups.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. City of Laguna Beach lifeguards are trained in MPA regulations and will issue advisories and warnings, if needed. Orange County Sheriff Deputies are trained in MPA enforcement and devote some patrol time to this area.

Baseline and ongoing monitoring and research studies: None found

Basic Evaluation: Provides some level of protection for most invertebrates, all plants and some fishes in a southern California coastal nearshore reef habitat. Heavy public use within the site and nearby, including illegal take and incidental trampling, and allowing most game species to be taken may have limited the effectiveness of protection. Enforcement presence often limited to times of highest use, while impacts incidental to visitation such as trampling are not the result of illegal activity. Local governments (Orange County Coastal Coalition) are interested in maintaining and increasing resource protection here.

Published references related to effectiveness of this MPA: 122, 127

Unpublished references related to effectiveness of this MPA: 185, 87, 173

Published references related to use of this MPA as a research tool: 38, 39, 189, 127, 208

Unpublished references related to use of this MPA as a research tool: 185, 87, 172, 173

Site name: Dana Point State Marine Park

Year established: 1969

Approximate Area: 0.16 nm²

Approximate Shoreline length: 0.56 nm

Approximate Depth range (feet): 0 to 60

Habitat types: Substrate at this site is approximately 90% hard and 10% soft with extensive rocky intertidal and subtidal reefs.

Surrounding habitat types: Sandy beach with offshore kelp forest and reefs to the north. Sandy areas with scattered reefs and rock breakwater to the southeast. Kelp forest and reefs with sandy areas offshore.

Summary of existing regulations: Take of all living marine resources is prohibited except the recreational take the following species below the mean lower low-water mark: lobster, rockfish (family Scorpaenidae), greenling, lingcod, cabezon, yellowtail, mackerel, bluefin tuna, kelp bass, spotted sand bass, barred sand bass, sargo, croaker, queenfish, corbina, white seabass, opaleye, halfmoon, surfperch (family Embiotocidae), blacksmith, barracuda, sheephead, bonito, California halibut, sole, turbot, and sanddab.

It is unlawful to enter the intertidal zone in the Dana Point State Marine Park for the purpose of taking or possessing, or to take or possess, any species of fish, plant, or invertebrate, or part thereof; to use or have in possession any contrivance designed to be used for catching fish; to disturb any native plant, fish, wildlife, aquatic organism; or to take or disturb any natural geological feature. This subdivision does not prohibit persons from entering the intertidal zone for the purpose of entertainment, recreation, and education while having a minimum impact on the intertidal environment and the living organisms therein. For this purpose, minimum impact includes foot traffic; general observation of organisms in their environment with immediate replacement of any unattached organisms to their natural location after temporary lifting for examination; and photography. Minimum impact does not include removal of attached organisms from their environment; gathering of fishing bait; littering, collecting rocks and shells; or turning rocks or other acts destructive to the environment.

Primary objectives: This area was originally designated as a marine life refuge. Although no specific objectives were provided for the marine life refuge designation, Fish and Game Code Section 10500 states that "Except under specific permit or authorization, it is unlawful: (f) To take or possess any invertebrate or specimen of marine plant life in a marine life refuge." In addition, individual marine life refuges may have been established for a variety of site specific purposes. This and several other marine life refuges along the Orange County coast were established in the late 1960's and 1970's to primarily protect intertidal organisms from collecting by the general public and large educational groups. A specific purpose for the Dana Point Marine Life Refuge was the complete protection from take of the intertidal zone in 1993 to provide improved opportunities for educational and research activities associated with the adjacent Orange County Ocean Institute.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. Orange County Sheriff Deputies are trained in MPA enforcement and devote some patrol time to this area. Ocean Institute staff and volunteers are frequently present in the Park conducting tours and monitoring visitor behavior which adds a layer of de facto enforcement.

Baseline and ongoing monitoring and research studies: The Ocean Institute monitors transects for status of a number of intertidal organisms, and also monitors intensity of usage by visitors. Mark Littler established a site at Dana Point during the 1975-79 BLM-sponsored studies of rocky intertidal biota. Steve Murray of CSU Fullerton recently re-assessed the distributions and abundances of rocky intertidal populations at Dana Point to examine decadal scale changes in intertidal systems.

Basic Evaluation: Provides some level of protection for most invertebrates, all plants and some fishes in an extensive southern California coastal nearshore reef habitat. Complete protection of marine life in the extensive rocky intertidal zone. Site is adjacent to and supervised by the Ocean Institute which conducts public educational programs and monitoring and research efforts in the site. Such programs have provided more protection for intertidal organisms compared to other MPAs nearby. Despite these efforts, heavy public use within the site and nearby, including illegal take and incidental trampling, and allowing most game species to be taken in the subtidal has limited the effectiveness of protection. Enforcement presence often limited to times of highest use, while impacts incidental to visitation such as trampling are not the result of illegal activity. Local governments (Orange County Coastal Coalition) are interested in maintaining and increasing resource protection here.

Published references related to effectiveness of this MPA: 122, 127

Unpublished references related to effectiveness of this MPA: 185, 87, 173

Published references related to use of this MPA as a research tool: 127

Unpublished references related to use of this MPA as a research tool: 185, 87, 172, 173

Site name: Doheny State Marine Park

Year established: 1969

Approximate Area: 0.11 nm²

Approximate Shoreline length: 1.09 nm

Approximate Depth range (feet): 0 to 60

Overlapping area: Doheny State Marine Conservation Area

Habitat types: Primarily sand. At minus tides some rocks are exposed. Subtidally there are small rocks with *Egregia* sp. Jetty rocks on east side.

Surrounding habitat types: Rock jetty and breakwater to the northwest. Extensive sandy beach to the south. Mostly sandy offshore with a few scattered reefs.

Summary of existing regulations: Take of all living marine resources is prohibited except the recreational take of: lobster, rockfish (family Scorpaenidae), greenling, lingcod, cabezon, yellowtail, mackerel, bluefin tuna, kelp bass, spotted sand bass, barred sand bass, sargo, croaker, queenfish, corbina, white seabass, opaleye, halfmoon, surfperch (family Embiotocidae), blacksmith, barracuda, sheephead, bonito, California halibut, sole, turbot, and sanddab.

Primary objectives: This area was originally designated as a marine life refuge. Although no specific objectives were provided for the marine life refuge designation, Fish and Game Code Section 10500 states that "Except under specific permit or authorization, it is unlawful: (f) To take or possess any invertebrate or specimen of marine plant life in a marine life refuge." In addition, individual marine life refuges may have been established for a variety of site specific purposes. This and several other marine life refuges along the Orange County coast were established in the late 1960's and 1970's to primarily protect intertidal organisms from collecting by the general public and large educational groups.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. State Park rangers, lifeguards and other staff provide an added on-site enforcement presence.

Baseline and ongoing monitoring and research studies: None found

Basic Evaluation: Provides a somewhat higher level of protection than the overlapping state marine conservation area for some invertebrates and all plants in a sandy beach area with a limited amount of rocky habitat. The Department of Parks and Recreation provides interpretive programs and educational displays. Heavy public use within the site and nearby, including illegal take and incidental trampling, and allowing most game species to be taken has limited effectiveness of protection. Enforcement presence often limited to times of highest use, while impacts incidental to visitation such as trampling are not the result of illegal activity. San Juan Creek discharges into site bringing contamination from urban runoff. Local governments (Orange County Coastal Coalition) are interested in maintaining and increasing resource protection here.

Site name: Doheny State Marine Conservation Area

Year established: 1970

Approximate Area: 0.16 nm²

Approximate Shoreline length: 1.09 nm

Approximate Depth range (feet): 0 to 60

Overlapping area: Doheny State Marine Park

Habitat types: Primarily sand. At minus tides some rocks are exposed. Subtidally there are small rocks with *Egregia*. No *Macrocystis* beds. Jetty rocks on east side.

Surrounding habitat types: Rock jetty and breakwater to the northwest. Extensive sandy beach to the south. Mostly sandy offshore with a few scattered reefs.

Summary of existing regulations: No recreational take of living or non-living marine resources is allowed except: finfish, chiones, clams, cockles, rock scallops, native oysters, crabs, lobsters, ghost shrimp, sea urchins, mussels and marine worms except that no worms may be taken in any mussel bed unless taken incidentally to the take of mussels. Commercial take is allowed.

Primary objectives: To provide additional protection to marine life and habitat within the state beach and to inform the public about the local marine life and need for protection.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. State Park rangers, lifeguards and other staff provide added on-site enforcement presence.

Baseline and ongoing monitoring and research studies: None found

Basic Evaluation: Provides some level of protection for some invertebrates and all plants in a sandy beach area with a limited amount of rocky habitat. The Department of Parks and Recreation provides interpretive programs and educational displays. Heavy public use within the site and nearby, including illegal take and incidental trampling, and allowing most game species to be taken has limited effectiveness of protection. Enforcement presence often limited to times of highest use, while impacts incidental to visitation such as trampling are not the result of illegal activity. Even protecting all species may not be effective without added enforcement presence and increased public awareness of impacts due to visitation. Increasing the level of protection within current boundaries could improve ecosystem and biodiversity maintenance functions. Expansion of site farther offshore may not be practical due to conflicts with existing commercial and recreational fisheries use. San Juan Creek discharges into site bringing contamination from urban runoff. Local governments (Orange County Coastal Coalition) are interested in maintaining and increasing resource protection.

SAN DIEGO COUNTY

Site name: Buena Vista Lagoon State Marine Park

Year established: 1969

Approximate Area: 0.27 nm² **Approximate Shoreline length:** 23.01 nm

Approximate Depth range (feet): not available

Habitat types: Estuarine tidal lagoon and channels with salt marsh habitat.

Surrounding habitat types: Coastal lowlands and bluffs, and urban development.

Summary of existing regulations: Take of all living marine resources is prohibited except the recreational take of species other than kelp by hook and line from shore between the hours of 6:00 a.m. and 12:00 midnight. Boating, swimming, wading, and diving are prohibited within the MPA.

Primary objectives: This area was originally designated as an ecological reserve. Fish and Game Code Section 1580 (ecological reserves) states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to ecological reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area.

Baseline and ongoing monitoring and research studies: None found.

Basic Evaluation: Insufficient information for evaluation at this time.

Site name: Agua Hedionda Lagoon State Marine Reserve

Year established: 2002

Approximate Area: not available

Approximate Shoreline length: 4 nm

Approximate Depth range (feet):

Habitat types: not available

Surrounding habitat types: not available

Summary of existing regulations: No take is allowed. The department, and the County of San Diego, after consultation with the department, may carry out management activities for fish and wildlife, flood control and vector control. Authorized operation and maintenance activities shall include, but shall not be limited to, use of chemicals, vegetation control, water control and use of associated equipment.

Primary objectives: This area was originally designated as an ecological reserve. Fish and Game Code Section 1580 (ecological reserves) states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to ecological reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area.

Baseline and ongoing monitoring and research studies: not available

Basic Evaluation: Insufficient information for evaluation at this time.

Site name: Batiquitos Lagoon State Marine Park

Year established: 1978

Approximate Area: 0.25 nm² **Approximate Shoreline length:** 2.67 nm

Approximate Depth range (feet): not available

Habitat types: Estuarine tidal lagoon and channels with salt marsh habitat.

Surrounding habitat types: Coastal lowlands and bluffs, coastal beaches and urban development.

Summary of existing regulations: Take of all living marine resources is prohibited except the recreational take of finfish by hook and line from shore.

Primary objectives: This area was originally designated as an ecological reserve. Fish and Game Code Section 1580 (ecological reserves) states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to ecological reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area.

Baseline and ongoing monitoring and research studies: None found.

Basic Evaluation: Insufficient information for evaluation at this time.

Site name: Encinitas State Marine Conservation Area

Year established: 1989

Approximate Area: 0.09 nm²

Approximate Shoreline length: 0.78 nm

Approximate Depth range (feet): not available

Habitat types: Primarily soft/sand bottom

Surrounding habitat types: Primarily soft/sand bottom

Summary of existing regulations: Take of all living marine resources is prohibited except the commercial and recreational take of finfish.

Primary objectives: This area was originally designated as a marine life refuge. Although no specific objectives were provided for the marine life refuge designation, Fish and Game Code Section 10500 states that "Except under specific permit or authorization, it is unlawful: (f) To take or possess any invertebrate or specimen of marine plant life in a marine life refuge." In addition, individual marine life refuges may have been established for a variety of site specific purposes.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area.

Baseline and ongoing monitoring and research studies: None found

Basic Evaluation: May provide some level of protection for some invertebrates and all plants in a sandy beach area with a limited amount of rocky habitat, however, present information is insufficient to provide a meaningful evaluation.

Site name: Cardiff and San Elijo State Marine Conservation Area

Year established: 1989

Approximate Area: 1.29 nm²

Approximate Shoreline length: 2.28 nm

Approximate Depth range (feet): 0 to 55

Habitat types: Intertidal sandy beach, cobble beach, intertidal platform and tidepools, localized rip-rap revetment. High and low relief reefs in the subtidal zone with patchy surfgrass and small kelp beds surrounded by sand, *Macrocystis* beds about 1000 ft offshore.

Surrounding habitat types: Similar to the site.

Summary of existing regulations: No recreational take of living or non-living marine resources is allowed except: finfish, chiones, clams, cockles, rock scallops, native oysters, crabs, lobsters, ghost shrimp, sea urchins, mussels and marine worms except that no worms may be taken in any mussel bed unless taken incidentally to the take of mussels. Commercial take is allowed.

Primary objectives: This area was originally designated as an underwater park. Underwater parks have no legally mandated mission but they are basically extensions of State Beaches. However, McArdle (1991) states "underwater parks are designed to preserve outstanding natural, scenic, and cultural values, indigenous aquatic and terrestrial fauna and flora, and the most significant examples of ecological regions in CA. The purpose of Cardiff and San Elijo State Marine Conservation Area is to make available to the people, for their benefit and enjoyment forever, the scenic and recreational resources inherent to the coastal beaches and adjacent uplands of San Diego."

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. State Park rangers, lifeguards and other staff provide an added on-site enforcement presence. There are seven rangers assigned to this site with one patrolling during the day and two to three at night. City lifeguards and county sheriffs may also provide some enforcement effort, if needed.

Baseline and ongoing monitoring and research studies: SANDAG 2000. EIR for beach sand replenishment has detailed habitat descriptions, plant/algae, invertebrates, fish and bird species lists ranging from 1993 to 1999, human usage reports from 1999; commercial fishery landings from 1987 to 1998, kelp maps from 1967-1992, kelp data from 1983-1999 and side-scan sonar data.

Basic Evaluation: Provides some level of protection for most invertebrates and some fishes in a southern California coastal nearshore reef/sand habitat. Actual effectiveness is limited because take of finfish and a number of invertebrate species is allowed.

Site name: San Elijo Lagoon State Marine Park

Year established: 1977

Approximate Area: 1.04 nm² **Approximate Shoreline length:** 4.74 nm

Approximate Depth range (feet): not available

Habitat types: Estuarine tidal lagoon and channels with salt marsh habitat.

Surrounding habitat types: Estuarine tidal lagoon and channels with salt marsh habitat.

Summary of existing regulations: Take of all living marine resources is prohibited except the recreational take of finfish by hook and line from shore. Boating, swimming, wading, and diving are prohibited within the Park. San Diego County, after consultation with the department, may carry out management activities for fish and wildlife management, flood control, vector control and regional park recreational activities. Authorized operation and maintenance activities shall include, but shall not be limited to, use of chemicals, vegetation control, water control, minor ditching and use of associated equipment.

Primary objectives: This area was originally designated as an ecological reserve. Fish and Game Code Section 1580 (ecological reserves) states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to ecological reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area.

Baseline and ongoing monitoring and research studies: None found.

Basic Evaluation: Insufficient information for evaluation at this time.

Site name: San Dieguito Lagoon State Marine Park

Year established: 1988

Approximate Area: 0.12 nm² **Approximate Shoreline length:** 1.43 nm

Approximate Depth range (feet): not available

Habitat types: Estuarine tidal lagoon and channels with salt marsh habitat.

Surrounding habitat types: Coastal lowlands and bluffs, and urban development.

Summary of existing regulations: Take of all living marine resources is prohibited except the recreational take of finfish by hook and line from shore and the Grand Avenue Bridge. Boating, swimming, wading, and diving are prohibited within the park.

No person, except state and local law enforcement officers, fire suppression agencies and employees of the department in the performance of their official duties or persons possessing written permission from the Department, shall be permitted on the California least tern nesting island.

No person, except state and local law enforcement officers, fire suppression agencies and employees of the department in the performance of their official duties or persons possessing written permission from the Department, shall enter this park between 8:00 p.m. and 5:00 a.m.

The County of San Diego, after consultation with the department, may carry out management activities for fish and wildlife, flood control and vector control. Authorized operation and maintenance activities shall include, but shall not be limited to, use of chemicals, vegetation control, water control and use of associated equipment.

Collections of fish, wildlife, water and soil may be made by the Department for the purposes of fish and wildlife management or by San Diego County for the purposes of water quality testing and vector control.

Primary objectives: This area was originally designated as an ecological reserve. Fish and Game Code Section 1580 (ecological reserves) states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to ecological reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area.

Baseline and ongoing monitoring and research studies: None found.

Basic Evaluation: Insufficient information for evaluation at this time.

Site name: San Diego-Scripps State Marine Conservation Area

Year established: 1957

Approximate Area: 0.11 nm²

Approximate Shoreline length: 0.54 nm

Approximate Depth range (feet): 0 to 20

Habitat types: Intertidal boulder field (Dike Rock area) and sandy beach with exposed cobble pockets. Subtidal sandy bottom and pier piling fouling community, submerged sandy plain with intruded lava, rocky reef, and pier pilings.

Surrounding habitat types: Similar to the site. Major rocky headland (La Jolla) with extensive kelp forest and reefs to the south. Scripps and La Jolla Submarine Canyons offshore.

Summary of existing regulations: Take of all living marine resources is prohibited except the commercial and recreational take of finfish. Licensees of the Regents of the University of California and all officers, employees, and students of such university may take, for scientific purposes, any invertebrate or specimen of marine plant life without a permit from the department.

Primary objectives: This area was originally designated as a marine life refuge. Although no specific objectives were provided for the marine life refuge designation, Fish and Game Code Section 10500 states that "Except under specific permit or authorization, it is unlawful: (f) To take or possess any invertebrate or specimen of marine plant life in a marine life refuge." In addition, individual marine life refuges may have been established for a variety of site specific purposes.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. Local lifeguards may provide an added enforcement presence. Local residents and businesses frequently observe the area and report suspicious activities. Despite this level of awareness, poaching frequently occurs here and a number of citations are written each year.

Baseline and ongoing monitoring and research studies: Davis, N. and G. Van Blaricom (1978) re-sampled sandy bottom transects that were sampled by Fager from 1957 - 1963 off of La Jolla Pier. The US Navy has some data available. Ron McCaunneghy from Scripps has been monitoring changes in the MPA.

Basic Evaluation: Provides complete protection for invertebrates and marine plants. Site provides an opportunity for collection and research by Scripps Institution of Oceanography personnel. Allowed take of fishes may limit this site's ecosystem protection value, but could provide an opportunity to examine effects of such regulations.

Site name: La Jolla State Marine Conservation Area

Year established: 1971

Approximate Area: 0.58 nm²

Approximate Shoreline length: 1.41 nm

Approximate Depth range (feet): 0 to 280

Habitat types: Rocky reefs and outcrops surrounded by sand. Surfgrass, kelp forest.

Surrounding habitat types: Similar to the site. Sandy and pebbly beaches to the north. Scripps and La Jolla Submarine Canyons offshore.

Summary of existing regulations: Take of all living marine resources is prohibited except commercial bait fishing for squid by use of hand-held scoop net west of a line drawn due north from Goldfish Point. Boats may be launched and retrieved only in designated areas and may be anchored within the conservation area only during daylight hours.

Primary objectives: This area was originally designated as an ecological reserve. Fish and Game Code Section 1580 (ecological reserves) states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to ecological reserves in marine areas, the Fish and Game Commission has extended this policy to those areas. A specific purpose for the San Diego-La Jolla State Marine Conservation Area was to provide an area of nearshore habitat protected from take for activities research associated with the adjacent Scripps Institute of Oceanography.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. This is a popular, well enforced MPA with a variety of important habitat types, although lobster poaching is suspected to occur at night. Local lifeguards may provide an added enforcement presence.

Baseline and ongoing monitoring and research studies: Numerous studies by Scripps Institute of Oceanography, especially by Drs. Paul Dayton and Mia Tegner.

Basic Evaluation: Provides nearly complete protection for all marine life (except for limited take of squid) and an opportunity for research and public enjoyment of undisturbed marine communities. Kelp bass and sheephead were found in higher densities and larger sizes in this MPA than in nearby areas open to harvest indicating that this MPA is protecting these desirable species to a greater extent than general fishery regulations elsewhere.

Site name: Mia J. Tegner State Marine Conservation Area

Year established: 1978

Approximate Area: 0.01 nm²

Approximate Shoreline length: 0.54 nm

Approximate Depth range (feet): 0 to 6 (intertidal)

Habitat types: Intertidally the northern part of the MPA has narrow exposed shelves with boulder/cobble overlying the pavement reef. The southern part has wider (60-100 m), flatter reefs with fewer high-relief outcrops, boulders and surge channels than the northern part of the MPA. Subtidal habitat is mostly rocky (extension of intertidal) with surfgrass and patches of small kelps (mostly *Egregia*).

Surrounding Habitat types: Extensive rocky shoreline and kelp forest reefs to the north. San Diego Bay entrance with scattered reefs and sandy areas. Extensive kelp forest reefs offshore.

Summary of existing regulations: Take of all living marine resources is prohibited except the recreational take of finfish and the commercial take of finfish and marine aquatic plants.

Primary objectives: To protect intertidal and shallow subtidal marine populations within the Cabrillo National Monument.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. National Park rangers and other staff provide and added on-site enforcement presence resulting in a closely policed area which appears to be effective in protecting resources from take.

Baseline and ongoing monitoring and research studies: Engle and Davis Navy, USGS, USMMS) have ongoing intertidal resources monitoring efforts since 1990. Zedler characterized intertidal resources in 1976 and documented public use and its effects in 1978.

Basic Evaluation: Provides protection to most invertebrates and plants in the intertidal zone. Cabrillo National Monument provides public interpretive and educational programs and information on marine life in the Reserve. Reserve appears to be effective as populations of many species, especially invertebrates such as limpets, snails and barnacles, and algae such as rockweed that are subject to harvesting and trampling pressure, are higher than in nearby areas open to take and unsupervised visitation.

Published references related to effectiveness of this MPA: 31, 49

Unpublished references related to effectiveness of this MPA: 218, 219

Published references related to use of this MPA as a research tool: 50, 51

Unpublished references related to use of this MPA as a research tool: 11, 47, 179

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